No. 14-1513

In The Supreme Court of the United States

HALO ELECTRONICS, INC.,

Petitioner,

v.

PULSE ELECTRONICS, INC.,
PULSE ELECTRONICS CORPORATION,

Respondents.

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

JOINT APPENDIX VOLUME I

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Petition For Certiorari Filed June 22, 2015
Certiorari Granted October 19, 2015

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UNITED STATES DISTRICT COURT,
DISTRICT OF NEVADA
(LAS VEGAS)

2:07cv331

Halo Electronics, Inc. v. Bel Fuse Inc. et al

Date Filed:	**03/15/2007**
Assigned To:	**Judge Andrew P. Gordon**
Referred To	**Magistrate Judge Peggy A. Leen**
Nature of suit:	**Patent (830)**
Cause:	**Patent Infringement**
Lead Docket:	**None**
Other Docket:	**U.S. Court of Appeals for the Federal Circuit, 13-01472** **U.S. Court of Appeals for the Federal Circuit, 13-01656**
Jurisdiction:	**Federal Question**
Class Code:	**Closed**
Closed:	**05/28/2013**
Statute:	**15:1126**
Jury Demand:	**Both**
Demand Amount:	**$0**
NOS Description:	**Patent**

No	Date	Proceeding Text
1	03/15/2007	COMPLAINT FOR PATENT INFRINGEMENT against all defendants (Filing fee $ 350 receipt number 511051), filed by HALO ELECTRONICS, INC.. Certificate of Interested Parties due by 3/25/2007. (Attachments: # 1 Civil Cover Sheet # 2 Summons to Bel

		Fuse# 3 Summons to Pulse# 4 Summons to Technitrol)(Harmon, Joshua) (Entered: 3/15/2007)
51	07/27/2007	AMENDED COMPLAINT (FIRST) Including Proof of Service with Jury Demand against all defendants, filed by Halo Electronics, Inc.. No changes to parties. Proof of service due by 11/24/2007. (Attachments: # 1 Exhibit A# 2 Exhibit B# 3 Exhibit C# 4 Exhibit D# 5 Exhibit E# 6 Exhibit F)(Woodford, William) (Entered: 07/27/2007)
435	11/08/2012	TRANSCRIPT of Proceedings, 429 Jury Trial DAY 2, held on Wednesday, November 7, 2012, before Judge Philip M. Pro. Court Reporter/ Transcriber: Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 11/29/2012. Redacted Transcript Deadline set for 12/9/2012. Release of Transcript Restriction set for 2/6/2013. (JPQ) (Entered: 11/08/2012)

440	11/13/2012	TRANSCRIPT of Proceedings, 438 JURY TRIAL DAY 3 held on 11/8/2012, before Judge Philip M. Pro. Court Reporter/Transcriber; Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/4/2012. Redacted Transcript Deadline set for 12/14/2012. Release of Transcript Restriction set for 2/11/2013. (ABB) (Entered: 11/13/2012)
442	11/14/2012	TRANSCRIPT of Proceedings, 441 JURY TRIAL – DAY 4 held on 11/9/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request

		due 12/5/2012. Redacted Transcript Deadline set for 12/15/2012. Release of Transcript Restriction set for 2/12/2013. (ABB) (Entered: 11/14/2012)
452	11/16/2012	PROPOSED Jury Instructions by Plaintiff Halo Electronics, Inc. Suggestions on the Court's Draft No. 1. (Countryman, Craig) (Entered 11/16/2012)
470	11/20/2012	JURY INSTRUCTIONS.(AC) (Entered: 11/21/2012)
464	11/21/2012	TRANSCRIPT of Proceedings, 443 JURY TRIAL – DAY 5 held on 11/13/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/12/2012. Redacted Transcript Deadline set for 12/22/2012. Release of Transcript Restriction set for 2/19/2013. (ABB) (Entered: 11/21/2012)
465	11/21/2012	TRANSCRIPT of Proceedings, 448 JURY TRIAL – DAY 6 held on

		11/14/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/12/2012. Redacted Transcript Deadline set for 12/22/2012. Release of Transcript Restriction set for 2/19/2013. (ABB) (Entered: 11/21/2012)
467	11/21/2012	TRANSCRIPT of Proceedings, 460 JURY TRIAL – DAY 8 held on 11/16/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Heather Newman, 702-464-5828. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the courts "Transcript Order" form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/12/2012. Redacted Transcript Deadline set for 12/22/2012. Release

		of Transcript Restriction set for 2/19/2013. (ABB) (Entered: 11/21/2012)
468	11/21/2012	TRANSCRIPT of Proceedings, 463 JURY TRIAL – DAY 9 held on 11/19/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Exceptional Reporting Services, Inc., 361-949-2988. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" "form available on our website www.nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/12/2012. Redacted Transcript Deadline set for 12/22/2012. Release of Transcript Restriction set for 2/19/2013. (ABB) (Entered: 11/21/2012)
482	11/26/2012	JURY VERDICT. (AC) (Entered: 11/27/2012)
479	11/27/2012	TRANSCRIPT of Proceedings, 471 JURY TRIAL – DAY 10 held on 11/20/2012, before Judge Philip M. Pro. Court Reporter/Transcriber: Felicia Zabin, 702-676-1087. Transcript may be viewed at the court public terminal or purchased through the Court Reporter/Transcriber using the court's "Transcript Order" form available on our website www.

		nvd.uscourts.gov before the deadline for Release of Transcript Restriction. After that date it may be obtained through PACER Redaction Request due 12/18/2012. Redacted Transcript Deadline set for 12/28/2012. Release of Transcript Restriction set for 2/25/2013. (ABB) (Entered: 11/27/2012)
514	01/11/2013	MOTION for Entry of Findings of Fact and Conclusions of Law by Defendants Pulse Electronics Corporation, Pulse Electronics Inc. (Attachments: # 1 Appendix, # 2 Proposed Order)(Reed, Kristopher) (Entered: 01/11/2013)
517	01/25/2013	RESPONSE to 514 MOTION for Entry of Findings of Fact and Conclusions of Law, filed by Plaintiff Halo Electronics, Inc.. Replies due by 2/4/2013. (Attachments: # 1 Appendix A, # 2 Proposed Order)(Countryman, Craig) (Entered: 01/25/2013)
518	02/01/2013	REPLY to Response to 514 MOTION for Entry of Findings of Fact and Conclusions of Law filed by Defendants Pulse Electronics Corporation, Pulse Electronics Inc. (Attachments: # 1 Exhibit A)(Reed, Kristopher) (Entered: 02/01/2013)
522	05/28/2013	ORDER re 514 Defendants Pulse Electronics, Inc. and Pulse Electronics Corporations Motion for Entry

		of Judgment of Findings of Fact and Conclusions of Law Under Rule 42. Pulse has not met its burden to prove the asserted patent claims are obvious. Pulse also has not met its burden to show Halo committed inequitable conduct before the PTO, that Halo should be equitably estopped from enforcing the claims, or that Halo should be barred under laches from collecting damages incurred prior to the filing of this lawsuit. Similarly, Halo has not met its burden to show Pulse willfully infringed the asserted patent claims. The Court therefore finds that Judgment should be entered in favor of Halo and against Pulse, with the exception of the issue of willfulness. Signed by Judge Philip M. Pro on 5/28/2013. (Copies have been distributed pursuant to the NEF-EDS) (Entered: 05/28/2013)
523	05/28/2013	JUDGMENT in favor of Plaintiff Halo Electronics, Inc. and against Defendants Pulse Electronics Corporation and Pulse Electronics Inc in the amount of #1,500,000.00. Signed by Judge Philip M. Pro on 5/28/2013. (Copies have been distributed pursuant to the NEF-EDS) Modified on 5/28/2013 to correct judgment type (EDS) (Entered: 05/28/2013)

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

13-1472

Halo Electronics, Inc. v.
Pulse Electronics Corporation

Case Number: 13-1472
Date Filed: 06/26/2013
Date Full Case Retrieved: 11/19/2015
Status: Terminated 10/22/2014
NOS Description: (999) 830: Patent Infringement (Fed. Question); Appeal

10/22/2014 OPINION and JUDGMENT filed, The judgment or decision is: Affirmed. (Precedential Opinion). (For the Court: Lourie, Circuit O'Malley,Circuit Judge and Hughes Circuit Judge). Concurring opinion filed by Circuit Judge O'Malley with whom Circuit Judge Hughes joins. [191619]

03/23/2015 PRECEDENTIAL ORDER filed denying petition for en banc rehearing filed by Halo Electronics, Inc. in 13-1472, denying petition for en banc rehearing filed by Pulse Electronics, Inc. and Pulse Electronics Corporation in 13-1472; denying petition for panel rehearing filed by Pulse Electronics, Inc. and Pulse Electronics Corporation in 13-1472. By: En Banc (Per Curiam). Service as of this date by Clerk of Court. [226147] [13-1472, 13-1656]

10/19/2015 **The petition for writ of certiorari, [14-1513], filed on 06/22/2015, was Granted on 10/19/2015. [282853]**

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UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

HALO ELECTRONICS, INC., Plaintiff, v. BEL FUSE INC., PULSE ENGINEERING, INC., and TECHNITROL, INC., Defendants.	2:07-cv-00331 FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT **JURY TRIAL DEMANDED**

FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, Halo Electronics, Inc. files this First Amended Complaint and demand for jury trial seeking relief for patent infringement by the Defendants. Halo Electronics, Inc. states and alleges the following:

JURISDICTION AND VENUE

1. This is an action for patent infringement arising under patent laws of the United States, 35 U.S.C. §§ 100 *et seq*. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

2. This court has personal jurisdiction over each of the Defendants because each Defendant has substantial and continuous contact within this judicial district and/or because each Defendant has committed acts of patent infringement within this judicial district, including placing infringing products into the

stream of commerce under circumstances such that each Defendant reasonably should have anticipated being subject to suit in this judicial district. The Court also has personal jurisdiction over each of the Defendants because the acts of patent infringement are aimed at this judicial district and/or have effect in this judicial district.

3. Venue is proper in this District pursuant to 28 U.S.C. §§ 1391(b) and (c) and 1400(b).

THE PARTIES

4. Plaintiff Halo Electronics, Inc. ("Halo") is a corporation organized and existing under the laws of the state of Nevada, and having its principal place of business at 3005 East Post Road Front, Las Vegas, Nevada.

5. Defendant Bel Fuse Inc. is a corporation organized and existing under the laws of the state of New Jersey. Bel Fuse Inc.'s headquarters is located at 206 Van Vorst Street, Jersey City, New Jersey.

6. Defendant Pulse Engineering, Inc. is a corporation organized and existing under the laws of the state of Delaware. Pulse Engineering, Inc.'s worldwide headquarters is located at 12220 World Trade Drive, San Diego, California.

7. Defendant Technitrol, Inc. is a corporation organized and existing under the laws of the state of Pennsylvania. Technitrol, Inc.'s corporate headquarters

is located at 1210 Northbrook Drive, Suite 470, Trevose, Pennsylvania.

8. Defendant Pulse Engineering, Inc. is a subsidiary of Technitrol, Inc.

COUNT I
(Patent Infringement)

9. Halo restates and realleges the preceding paragraphs of this First Amended Complaint.

10. On August 12, 1997, United States Patent No. 5,656,985 ("the '985 patent") entitled "Electronic Surface Mount Package" was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '985 patent by assignment. A true and correct copy of the '985 patent is attached as Exhibit A.

11. On October 2, 2001, United States Patent No. 6,297,720 ("the '720 patent") entitled "Electronic Surface Mount Package" was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '720 patent by assignment. A true and correct copy of the '720 patent is attached as Exhibit B.

12. On October 2, 2001, United States Patent No. 6,297,721 ("the '721 patent") entitled "Electronic Surface Mount Package" was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '721 patent by assignment. A true and correct copy of the '721 patent is attached as Exhibit C to this Complaint.

13. On November 20, 2001, United States Patent No. 6,320,489 ("the '489 patent"), entitled "Electronic Surface Mount Package With Extended Side Retaining Wall," was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '489 patent by assignment. A true and correct copy of the '489 patent is attached as Exhibit D.

14. On February 5, 2002, United States Patent No. 6,344,785 ("the '785 patent"), entitled "Electronic Surface Mount Package," was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '785 patent by assignment. A true and correct copy of the '785 patent is attached as Exhibit E.

15. On December 16, 2003, United States Patent No. 6,662,431 ("the '431 patent"), entitled "Electronic Surface Mount Package," was duly and legally issued by the United States Patent and Trademark Office. Halo owns the '431 patent by assignment. A true and correct copy of the '431 patent is attached as Exhibit F.

16. Defendant Bel Fuse, Inc. has been and is infringing, actively inducing others to infringe, and/or contributing to the infringement of the '985, '720, '721, '489, '785, and '431 patents by making, using, selling, and/or offering to sell surface-mount transformers embodying the patented inventions and/or devices that have or contain an electronic surface-mount package embodying the patented inventions, including, but not limited to, part number S558-5500-12-F.

17. Defendants Pulse Engineering, Inc. and Technitrol, Inc. have been and are infringing, actively inducing others to infringe, and/or contributing to the infringement of the '985, '720, '721, '489, '785, and '431 patents by making, using, selling, and/or offering to sell surface-mount transformers embodying the patented inventions and/or devices that have or contain an electronic surface-mount package embodying the patented inventions, including, but not limited to, part numbers H1102NL and HX1188NL.

18. Upon information and belief, Defendants have been and are infringing the '985, '720, '721, '489, '785, and '431 patents with knowledge of one or more of the patents, and thus Defendants' infringement is willful.

19. Upon information and belief, Defendants will continue to infringe the '985, '720, '721, '489, '785, and '431 patents unless and until they are enjoined by this Court.

20. The Defendants have caused and will continue to cause Halo irreparable injury and damage by infringing the '985, '720, '721, '489, '785, and '431 patents. Halo will suffer further irreparable injury, for which it has no adequate remedy at law, unless and until the Defendants are enjoined from infringing the '985, '720, '721, '489, '785, and '431 patents.

PRAYER FOR RELIEF

WHEREFORE, Halo respectfully requests that this Court:

(1) Enter judgment that Defendants have infringed the '985, '720, '721, '489, '785, and '431 patents;

(2) Enter an order permanently enjoining Defendants and their officers, agents, employees, attorneys, and all persons in active concert or participation with any of them, from infringing the '985, '720, '721, '489, '785, and '431 patents;

(3) Award Halo damages in an amount sufficient to compensate it for Defendants' infringement of the '985, '720, '721, '489, '785, and '431 patents, together with prejudgment and post judgment interest and costs under 35 U.S.C. § 284;

(4) Treble the damages awarded to Halo under 35 U.S.C. § 284 by reason of Defendants' willful infringement of the '985, '720, '721, '489, '785, and '431 patents;

(5) Declare this case to be "exceptional" under 35 U.S.C. § 285 and award Halo its attorney fees, expenses, and costs incurred in this action; and

(6) Award Halo such other and further relief as this Court deems just and proper.

JURY TRIAL DEMAND

Halo demands a trial by trial on all issues appropriately triable by a jury.

Dated: July 27, 2007 FISH & RICHARDSON P.C.

By: /s/ William R. Woodford
William R. Woodford

Attorney for Plaintiff
HALO ELECTRONICS, INC.

CERTIFICATE OF SERVICE

I certify that on July 27, 2007, I caused a true and correct copy of the **FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT** to be filed electronically with the Clerk of Court through ECF, and ECF will send an email notice of the electronic filing to the following:

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UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC.,	CASE NO: 2:07-CV-331-PMP-PAL
Plaintiff,	CIVIL
vs.	Las Vegas, Nevada
PULSE ELECTRONICS, INC., ET AL.,	Wednesday, November 7, 2012
Defendants.	(8:59 a.m. to 12:02 p.m.) (1:17 p.m. to 4:34 p.m.)

JURY TRIAL – DAY 2

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
Law Clerks:	Kara Rickey/Cristen Thayer
Court Recorder:	Henry Enriquez
Courtroom Administrator:	Donna Sherwood
Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[30] THE WITNESS [Jeffrey Heaton]: When it began to affect our business was about 1992.

THE COURT: So, shortly after you started.

THE WITNESS: Exactly.

THE COURT: All right.

THE WITNESS: Yes, sir.

BY MR. MELSHEIMER:

Q So, then, we have here on the right-hand side, sir, just an example of surface mounting, and why don't you walk us through that as well, just like you did with the through-hole mounting.

A So, here the horizontal green area, again, is the printed circuit board. Those little blue dabs are solder paste that's been applied to the board, and then the pick-and-place equipment will come grab the part and load it onto the board right on the solder pads that have those – that solder paste. Then it will go through a different type of a reflow process, and as you can see here, unlike – with the through-hole process the heat was all on the bottom side of the board. The printed circuit board effectively created a nice blanket, a insulation blanket where that heat doesn't get up to the component. Now the entire component is just bathed in this high temperature. So, it's quite a bit different requirement for the component now.

Q Mr. Heaton, was there some advantage to your customers to [31] the surface-mount technology?

A Absolutely.

Q What were those advantages?

A Well, if we go back to the pictures that are here, you can see with the surface-mount part the entire bottom side of the printed circuit board has now been opened up. We can either add more components or the customer can add more components there to add more features to his product or he can shrink the size of his total product, which as you see today with your telephones, those were effectively computers that used to be gigantic and now you've got a pocket-sized computer. Surface-mount technology has been a big part of the ability to do that.

Q So, it sounds like this was pretty good for your customers, but was it challenging for Halo?

A Absolutely.

Q What were the problems you were having at Halo with this new surface-mount technology?

A The high temperature that the body was seeing created a lot of stresses on the parts; the parts began to crack or twist; we had some electrical issues internally that we had never had before with the through-hole components.

Q What was causing those kinds of failures that you described?

A It was the high temperature and then a thing called "thermal expansion" of the materials, of the package, and what [32] was inside the package.

Q Can you tell the jury what you mean by "thermal expansion"?

A Yeah. As materials heat up, they will tend to expand, and as they cool down, they will contract again. That builds up a lot of pressures inside of a – or can build up a lot of pressure inside of a package for – for a component like this.

Q Had these problems existed with your through-hole package?

A No. Again, with having the heat on the bottom side of the board we just didn't have to deal with this at all.

Q We're going to talk about this some more, sir. You didn't mention, and I want to ask you about it; was there a problem with moisture in connection with the manufacturing and putting together these components on the printed circuit boards?

A Right. Moisture would certainly add to the problems we were having, just make it worse. If moisture was stuck inside of the package, it would expand even further and create more stresses.

Q I just want you to just explain on that a – expound on that a little bit, sir. So, I mean, we're not talking about, you know, pouring a glass of water on these things, are we?

A That's correct.

Q All right. Now, these things are very small, correct?

A Yes. Uh-huh.

Q So, what is it about – how much moisture do you have to

* * *

[59] numbers demonstrating those prototypes that we had received.

Q Is this – is the date on this document, sir, August of 1994, is that consistent with your memory about how and when you received the samples?

A Yes, it is.

Q What did you do with the samples once you got them?

A Again, because we were a small company with limited resources both my brother and me wanted to have the opportunity to do some hands on testing ourselves. So, I took a quantity of these parts and took them home with me and, much to my wife's amazement, pre-heated her oven as high as it would go and put the parts on a cookie sheet and once the oven was preheated, I put the parts in, trying to create as great a thermal shock as I could.

Q Sounds like you might have created some shock around the house. Mr. Heaton, why didn't you just take these parts to Halo's high tech testing lab?

A That would have been nice. We did not have such a thing in those days.

Q What did you find out after you – well, you don't have such a thing today, do you?

A We don't. Our partner does.

Q So, what happened when you put the sample parts in the oven? What did you do, leave them in there for a while?

A I did. I left them in longer than I knew they would be [60] exposed to in our customers' process trying to make a worst case scenario, and then pulled them out.

Q What was the result of this home testing?

A It was excellent. I didn't actually expect them to crack, but I was really just focused on was there any twisting; was there any warping; was there any evidence of thermal expansion that had changed the mechanical package and we were just thrilled to see the great results we saw.

Q Did it stink up your kitchen a little bit?

A A little bit.

Q So, at this point, was this the kind of test where you could say, "We're done. This thing's proven it works"?

A No, sir.

Q Why not?

A Even today, with more equipment available to us, it's very difficult to emulate our customers'

processes. So, we felt we really needed to find some customers who would be willing to test parts in their process.

Q Did you communicate with two different companies about testing your new design?

A We did.

Q Which companies were those, sir?

A Hewlett Packard and a company called Chipcom.

Q Now, Hewlett Packard we've certainly heard of. Is that the computer and printer company?

[61] A Yes, it is.

Q What is Chipcom?

A They're a manufacturer of networking equipment, switches, routers, and so forth.

Q So, let's first talk about your interactions with Hewlett Packard, sir. What were the discussions between Halo and Hewlett Packard about this sample design?

A Hewlett Packard was migrating quickly from through-hole components to surface mount components. They'd already experienced some issues with some competitive product in the industry and wanted to try a number of different manufacturers' parts to see which might be the most reliable.

Q Did Halo end up sending some samples to HP?

A We did.

Q Take a look at Plaintiff's Exhibit 50, sir, in your book.

Your Honor, I believe there's no objection to Plaintiff's Exhibit 50.

THE COURT: Any objection to 50?

MR. SIPIORA: None, your Honor.

THE COURT: That will be received.

(Plaintiff's Exhibit Number 50 was received in evidence)

BY MR. MELSHEIMER:

Q What is Plaintiff's Exhibit 50, sir?

A This is an invoice for a shipment – a small quantity shipment – to Hewlett Packard.

[62] Q What is the date of it?

A The invoice date is October 26th, 1994.

Q And what is it about this invoice that tells you these were the samples that you sent to Hewlett Packard to test?

A The small quantity here would indicate that this is not going to be a production order. This was a high volume division of Hewlett Packard. Two hundred

pieces wouldn't even get them to start turning their production line on.

Q What was Hewlett Packard's reaction after they received these samples?

A They were pretty skeptical. It was a new looking part. It was a new technology. They were a little concerned about the exposed solder joints bottom of the part and they were skeptical.

Q Do you know if Hewlett Packard ever actually tested these samples?

A I can't confirm that, no.

Q Did you ever receive a report back from them of any testing they'd done?

A No.

Q Did they end up placing any orders for the product at that time?

A No.

Q Now, did a division of Hewlett Packard end up purchasing the Halo products several years later?

* * *

[130] Q And the reason why is because through-hole technology would have no need for this gull wing leading out, because it's actually attaching under the board, right?

A It's our what – attaching under the board –

Q The leads are actually being soldered underneath the board.

A I'm sorry, I'm not following your question.

Q Okay, sure. Let me rephrase that.

So when you see the gull wing technology, the gull wings into this line, you can pretty much tell it's surface mount technology, right?

A That is correct.

Q All right. Because through-hole could be the alternative before – these, (indicating), things go right to the board. You don't need this going out the top of the board, right?

A That's correct.

Q So this surface mount technology we're seeing they were using this gull wing construction, correct?

A That was one of the constructions, yes.

Q So you are not claiming that this gull wing, the design, which is in your – claims of your patent, is something that Halo developed.

A That's correct.

Q It was well known.

A Correct.

* * *

[134] Q – to the Toroid.

A That's correct.

Q And that forms a connection.

A That's correct.

Q Now, you don't claim that the concept of a notched post is something that is unique to your patent, correct?

A That's correct.

Q In fact, this drawing in 1992 from Perfect Brave shows a notched post if you turn to the second page. Do you see that?

A Yes.

Q And that's a notched post of the type that is described in your invention, correct?

A That's correct.

Q Okay. So at least in 1992 we already know that Halo was using a notched post in an earlier design, correct?

A That's correct.

Q Now, if you could stay with this drawing just for a minute, that same page. On this drawing – and just to be clear so everyone can see this – I guess I can –

MR. SIPIORA: Can we blow it up just a little bit so we know what we're talking about to make sure everybody is following?

That's the notched post that we're talking about in the 1992 PBL drawing that we're looking at, correct?

A Yes, that's correct.

[135] Q Yeah, okay. And that's the same type of shape, the hourglass shape, literally that phrase, hourglass shape, that appears in some of the claims of your patent, correct?

A I believe so, yes.

Q It's describing that same very thing, correct?

A I believe so.

Q Okay. And we've established then that that feature is not new or novel in your patent, you already were doing it in '92.

A Yes.

Q Okay. Now, if you can take a look at the drawing, that same drawing, we can push that back. And if you look at line number 8 –

MR. SIPIORA: If you could just – that, Mr. Traux, just above that, maybe pick up the whole thing all the way down to the drawing. Okay.

Q So it says, "Lead frame Valor P/N 300-0010 is an acceptable alternate." Do you see that?

A I do.

Q That's the reference to a Valor part number, correct?

A It appears to be.

Q All right. And Valor is one of the competitors that existed in the market before you were formed as a business, correct?

A That's correct.

Q All right. And when it says this part number is an [136] acceptable alternate, it's saying that with respect to this particular feature a Valor part could be used instead, correct?

A Valor lead frame it appears – yes.

Q Okay. So if we could pull up DTX – I'm going to do it this way again through – DTX-559, if you would go through your notebook there, please. And if you could –

MR. SIPIORA: I don't believe there's any objection to this exhibit.

THE COURT: Is there any objection to 559?

MR. MELSHEIMER: No objection, your Honor.

THE COURT: Thank you. 559 will be received then.

(Defendants' Exhibit Number DTX-559 was received in evidence)

BY MR. SIPIORA:

Q All right. So if you could – this drawing is a Valor drawing, correct?

A I'm sorry, it's a what?

Q A Valor drawing.

THE COURT: Valor, V-a-l-o-r?

MR. SIPIORA: Right.

THE WITNESS: Sitting here I don't know how I can confirm that. Is there a name on it somewhere?

BY MR. SIPIORA:

Q Yeah. I need my glasses actually to see it.

(Pause)

[137] So first of all let's look at the bottom right. This is a – it's hard to read. It says lead – do you see on the bottom it says "leadframe"?

A Yes.

Q Okay. And if you'd look at page – the third page in, which is – all right. Do you see the number 30001 – 0010 on the top?

A Yes, I do.

Q Okay. And that –

MR. SIPIORA: If we could just pull back – I'm sorry, Mr. Traux. If you could go back to admitted

Exhibit 560 just for a minute. If you'd go to Line 8. I like that . . .

Q Do you see the number there, Valor Part Number 300-0010? Do you see that number?

A Yes, I do.

Q Okay. Now we go back to Exhibit 559. And do you see at the upper right there 300-0010?

A Yes, I do.

Q Okay. And that corresponds to the Valor part number described earlier as a substitute in your drawings or PBL's drawings for this particular component, correct?

A I can't confirm that.

Q Well, the numbers are the same.

A I can confirm the numbers are the same.

Q Okay. But you can't confirm this is a Valor part. Is [138] that what you're saying?

A That's correct.

Q Okay. If you would go to the first page of this document. And it says in the middle of the page, it says "From so-and-so Valor East." Do you see that?

A Yes, I do.

Q Okay. So it says there it's Valor East and it's the exact same part number as referred to in your previous drawing, correct?

A The same part number, yes.

Q Okay. So let's go to the drawing that we saw previously on that page.

MR. SIPIORA: On the right-hand side, if you could blow that up.

Q And that's a notched post, isn't it?

A It appears to be.

Q And if you look at it, it's got the hourglass shape just the same as we saw on that previous drawing from 1992 from PBL, correct?

A Yes.

Q Okay. And, in fact, if you put these together

MR. SIPIORA: And if we could pull up demonstrative DEMO-2.

Q So on the left-hand side, if you follow with me here, these are drawings for the solder post we've just been looking [139] at. On the left – I'm sorry – on the right is the Halo design which we saw, which is 560, which has the detail A; it shows the dimensions.

And on the left is this 1989 document, which has Part Number 300-0010 in reference to Valor. Do you follow me?

A Yes, I do.

Q Okay. Do you see any differences in the dimensions between these two drawings?

A Not in the dimensions that are provided. They appear to be the same.

Q Okay. These drawings are virtually – they're identical in their dimensions down to the hundredths, thousandths of a measurement, correct?

A In the section we are looking at, yes.

Q Okay. So is it fair to say that the Halo drawing is identical to the 1989 Valor drawing?

A Of this section of it, yes.

Q Yeah. And this section being the drawing that shows the notched post, correct?

A Correct.

Q And this is the same notched post that you find in 1994 or 1995 when you filed the patent application, correct?

A I don't know that to be true.

Q Okay. Well, we'll get to that. But at least this far we can agree that your 1992 or PBL's 1992 notched post is [140] identical to the notched post that Valor had, identical in this drawing from 1989.

A It appears to be.

Q One of the things – I'm going to switch gears.

MR. SIPIORA: We can take that down.

Q One of the things that you talked about was this notion of open construction. Do you recall that testimony?

A Yes.

Q All right. And from your point of view this is seminal to your inventions, critical to your invention, the idea of moving away from a box that's closed to a package or a box that's open, correct?

A That was part of what was important, yes.

Q Well, the phrase that you've used over time to describe your invention in shorthand is "open construction," correct?

A Correct.

Q And open construction is shorthand for the idea of opening that box to overcome those heat issues you talked about.

A No, that's not correct.

Okay. So you do use the phrase "open construction" as a shorthand for your invention, correct?

A We do.

Q Okay. Now, are you aware of the fact that prior to development of whatever you did develop in 1994-95, there were other surface mount open construction products on the market?

[141] A I am not aware of that.

Q Okay. Well, there was a product called the Bel Fuse Topper that was an open bottom, surface mount product that existed before your conception, correct?

A I don't know that to be true.

Q Okay.

MR. SIPIORA: So let's pull up JH-40, please.

"QUESTION: Prior to you developing this open construction design in 1994, were you aware of any open construction surface mount transformers on the market?

"ANSWER: I was not. Since then, I've – I've – I've learned through this process that there was something called a topper that may have come out shortly before our part did."

BY MR. SIPIORA:

Q Did I ask you that question and did you give that answer in your deposition?

A I did.

Q So, in fact, you did learn that there was this thing called the Topper made by Bel Fuse, which is the company that you used to sell for and that terminated you and led to your development of Halo, correct?

A That was a bunch of questions there, let's –

Q Yeah, it was. So you came to know that prior to your [142] development of open construction that another company, Bel Fuse, had an open construction surface mount technology design, correct?

A Correct, I have heard hearsay. But there may have been something before our – before we developed our construction, that's correct.

Q And Bel Fuse displayed its concept of the Topper product, the Bel Fuse Topper, the open construction surface mount technology in 1993; isn't that correct?

A I don't know that I know that.

Q Okay.

MR. SIPIORA: Can we play JH-41, please?

"QUESTION: Well, the concept displayed in these data sheets from Bel Fuse in 1993, was that a concept of an open-bottom surface mount transformer part?

"ANSWER: Correct."

BY MR. SIPIORA:

Q So you were aware that before you had any conception of your claimed open bottom construction, another company, Bel Fuse, already had an open bottom surface mount technology construction, correct?

A Can you restate –

Q Sure -

A – that again, please?

Q Sure. Before – your conception was in the 1994 time [143] period, correct?

A That's correct.

Q And you're aware, as you have now acknowledged, that in 1993 you've come to know that another company, Bel Fuse, already had an open construction surface mount technology product, correct?

A Okay. Yes, I have come to be aware of that since then, yes.

Q So Bel Fuse had an open construction before you did, quite simple.

A Yes.

Q Okay.

THE COURT: It's a good point to break. We're right at the noon hour, so we'll go ahead and take our luncheon recess.

Ladies and gentlemen, we'll be in recess for an hour and 15 minutes. We'll reconvene at 1:15. If you could be back in the jury room by ten minutes after the hour, that would be great.

During this recess as you go out and grab lunch, please remember again the admonition not to discuss the case amongst yourselves or with others. Don't conduct independent research or investigation or

consider news accounts. And remember to reserve your judgment until the case is finally submitted with you.

[195] Q Now, you were asked some questions about open construction or open bottom and I want to make this clear. Is open bottom the same thing as open construction?

A No, it is not.

Q What is open bottom?

A Open bottom would be just an open bottom without the other elements of our patent.

Q What do you mean by open construction?

A Open construction is going to go ahead and have all of the elements of our patent. That's the term we use.

Q Now, you were asked a lot of questions on cross examination about, "Well, did you invent gull wings? Did you invent toroids? Did you invent transformers? Did you invent silicone?" Did you invent any of those things?

A No, we did not.

Q What is your invention, sir? Those individual items or is it the combination of all those items put together in a particular way?

A It is the combination of all of those things put together.

Q And where is that combination described as a matter of law? Where is it described?

A In our patent.

Q And did you ever claim to anyone that you'd invented silicone or gull wings or toroids or transformers?

A I never did.

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 8, 2012
Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC Plaintiff, vs. PULSE ELECTRONICS, INC., ET AL., Defendants.	CASE NO: 2:07-CV-331-PMP-PAL CIVIL Las Vegas, Nevada Thursday, November 8, 2012 (8:47 a.m. to 12:01 p.m.) (1:13 p.m. to 4:29 p.m.)

JURY TRIAL – DAY 3

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
Law Clerks:	Kara Rickey/Cristen Thayer
Court Recorder:	Henry Enriquez
Courtroom Administrator:	Donna Sherwood
Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[72] THE COURT: I apologize. Let me interrupt. Does this switch from the lead to something that was not lead for solder relate to the claims at issue in this case?

MR. WOODFORD: It does have an impact, your Honor, on the design and why this design is more robust because it can deal with it.

THE COURT: I see. All right. All right. Go ahead. I'm sorry. Please continue.

THE WITNESS [Wilmer R. Bottoms Jr.]: So we were trying to delay the date certain when that banning of lead took place so that we had time to develop an alternative, and so it was delayed for quite a while. But finally in 2002, the EU published – European Union published a document that said by 2006 all lead is banned.

BY MR. WOODFORD:

Q Well, and I may ask you some questions about that a little bit later on, but thank you for the introduction to that issue.

Now, you were saying that the packages were failing. Can you give us an example of a failure that was occurring because of this – you know, this high heat?

A Well, this – at this point we've already heard that so I'll repeat it. There are several types of failure that occur, as we heard yesterday. The wires can break. The package can warp. The package can

actually crack. The lid, if it's a two-piece package, can get blown off by the force of that [73] expansion, a lot of things that happen to cause failure.

Q So you just mentioned the two-piece package, and we heard a lot about the two-piece package yesterday. Could you just describe that in a little more detail for the jury?

A I think I have a demonstrative that shows that. So what we're looking at here is the same two-piece package that Halo was manufacturing that Peter Lu talked about yesterday except I've got two different colors of the same material. The black material on the bottom is the plastic that the lead is embedded in, and that's called the header of the package. And the lighter color, the gray color on the top, which I guess I can circle this color, that's called the lid.

And so in this case, they would glue the lid onto the header with a glue that should be strong enough to survive the forces they expected to overcome. And that hole that's in there is to let us go in, look in and see the wires and you can see the posts and you can see the toroids. That's not there for us to see; it's there because they have to put something inside. So their solution to make it mechanically robust and make it strong was to put plastic material and filling up all that extra space inside.

And so let's go to the next step, and it filled up all the space. And we didn't see the dynamics of that space being filled, but now we're left with this package composed of a lid glued to a header and filled

with epoxy. And if I just [74] take the other parts off and see what that plastic epoxy that was inserted looks like, let's take those off and now you can see it. So now it looks like basically one big piece of plastic epoxy with the lids – with the leads coming out of it.

Q So what specifically would happen with this part when it went through the surface mount soldering process?

A Well, this part had a lot more causes for failure than some of the others, and it was typical of what people were building at the time. Maybe say more about that later. But as the components inside would get heated, they would swell, and so they got larger because things expand when you heat them. And eventually, the pressure of that could cause the package to fail. And as we heard yesterday, if you crack the case, if you pop the lid off, it could actually damage the toroid inside because the toroid can be damaged by being subjected to pressure. It can break the wires. It can even cause it to warp. So when I push it down to solder it, the warpage prevents all the pins from making the contact necessary to get it in to the joint.

Q So can I follow up on a couple of those? When you said if the pressure on the cores that could cause some sort of failure, what does that mean?

A The – say that again.

Q Well, you said that there's pressure on the internal of the toroids that we were seeing.

[75] A Oh, yes, on the cores, I'm sorry. I didn't catch that word. So the toroids that are inside, and if you had donuts yesterday as the Judge described them, you know exactly what these are except they are except they are way smaller of materials. I've never seen material that size. They are tiny little things, but they're ferrite materials. So that means they're magnetic materials, and they have magnetic properties when you subject them to a current flowing around them. They actually absorb energy into the magnetic field. And the properties, the electromagnetic properties of that material, are critical to its proper operation.

And I won't go into all of the technical details behind that, but when you put large pressure on the cores, particularly if the pressure is differential, that is if some part gets a lot pressure and something doesn't, the magnetic – electromagnetic properties change and the circuit won't work correctly anymore. So you can actually cause complete circuit failure, not able to perform the function for which it was designed just by putting that pressure on it. So as those toroids try to expand and that epoxy or the plastic tries to expand and puts that pressure on (indiscernible).

Q What about the issue of the breaking wires, how did that happen?

A Well, a similar kind of thing. You know, the wires – obviously as these things expand and contract, the wires will [76] get flexed. And since the cores are that small, the wires are a lot smaller. It

can break the wires. We could also have a situation where the plastic was actually holding the wire really tightly. And it's attached to a metal piece on the other end. And maybe they move with respect to one another, the wire could break. So without defining it to one single mechanism, the stresses associated with the mechanical movement and the mechanical forces can cause those wires to break when you heat the package to an elevated temperature.

Q Now, we've heard previously during this case the concept of moisture and moisture in these parts. Explain that to us.

A Yes. These plastic materials that are used, they have a property that's called hydroscopic property – hydroscopic property. It's spelled h y d r o p s c o p i c, hydroscopic. And that means it absorbs moisture. Well, and we heard that this work takes place in – a lot of it in Asia, where temperature and humidity is high. Some of you have been there undoubtedly have experienced that yourself. And when that moisture is absorbed by these materials and then you put it in a sealed package, when you heat it above the boiling point of water it wants to turn into steam.

Well, the boiling point of water on a Centigrade scale, it's 100 deals Centigrade, Fahrenheit 212 degrees. What temperature are we heating these to, 480 degrees in the extreme – actually, we'll get to extreme, but in the surface mount it [77] goes up to 440 on all of these processes and higher as we go to lead-free. And so that's why it's relevant that we

wanted the lead-based solder. That's a huge temperature change, and that can cause – the steam builds up pressure and eventually blows holes in it. They actually call that popcorning. You can –

Q Let me stop you there. Popcorning?

A Popcorning, yes.

Q Okay. What is that?

A Well, you've all seen popcorn, right? Why do those corns pop? You know, you have little kernels and they pop. It's because there's moisture inside. And as you heat it up, when it gets to a hot enough temperature that the pressure is greater than the strength of that kernel it just blows it up. Then you can eat it, so it's useful in that case. It's not particularly useful in these packages because they're damaged. They can't be used if they have holes in them.

Q Now, the other – one of the other failures you mentioned was warping or twisting. Would you just describe specifically what that means?

A Yes. As force is exerted from inside of the package as it gets heated – and of course, it's exerted on the other parts as well – instead of being flat – and I know we heard Mr. Heaton testify that he put these things in the oven and took them back out, and they were still flat and he was so happy. These two-piece packages, if you put them in the oven [78] and take them back out, they're not flat. And so they can fail to make good contact. It's real critical when you take these leads and put them onto these pads that each

one of the pads is coplanar, a term that we heard described yesterday. They're in the same plane. All of the pads have to touch at the same time. If they don't, when we try to heat it so that the solder flows it may be flow but it won't join them together because they're not touching.

Q Just real briefly, the – we talked a lot about the two-piece construction. Were there other constructions that were sort of industry standards at that time for this type of part?

A Yes. And we heard about that yesterday as well, transfer molding. It basically generates the same thing. Instead of using two pieces to form a case and filling it with epoxy, you actually use a mold. You put the components in, the wires and the transformers and the leads, and then inject a plastic material in. It's epoxy as well. It's also hydroscopic, which means it absorbs the moisture. And all –

Q So would that part have the same failures?

A Yeah, all the same failure mechanisms can apply.

Q So what impact did this have on the industry?

A Well, the industry had a real crisis, and it was a bigger crisis for some than others because it meant that they were shipping relatively low-cost products, their customers were putting them on relatively high-cost products, putting them [79] through this automated soldering system, and then

having that part fail. And so now they've got this high-cost product that didn't work because the packages that were used to package these magnetic components didn't survive the assembly process with high enough heat.

Q So what impact did that have on Halo?

A Well, it had a bigger impact on Halo. As we heard, Halo was a tiny company. They didn't have many employees. They actually used a partner to do their manufacturing. And when they begin to have failures, if they lost their few customers, they actually wouldn't exist. I would say it actually threatened their existence, and we heard that testimony yesterday.

Q Okay. We've talked a lot about failures and why these parts failed. Let's move on and talk about solutions. What were companies doing to try to solve this problem at the time?

A Well, you know, the problem had actually been there for some time because people knew about it when they first started trying to use surface mount components. And of course, it became worse when we had to dispense with lead and go from 225 degrees to 260 degrees as the temperature to refill the solder. That's a little over 500 degrees Fahrenheit, about 505 degrees. And so now we've got failures and everybody is looking for ways to solve the failure. Everybody in the industry was. And they all used different approaches.

[80] As a matter of fact, at the same time there was another thing going on, and that is everybody that makes products is trying to make them smaller for reasons that you know and we've talked about it enough to go over them again. But in trying to make them smaller, you want to decrease the size of the package. There's several ways you could do that. You could get rid of posts where you wrap wire around it and solder it. That takes up space.

And there were proposals and prototype products that did that, in fact, even some products that were offered for sale. They reduced the size of the width of the package wall so that it didn't take up so much space. And I'll actually describe that later when we start talking about the Halo part. But all of these things decreased the strength and actually caused the problem to get larger. To the best of my knowledge, none of the solutions other than the solution that Halo eventually came up with was a successful solution to this problem.

Q Well, let's please talk about the – let's talk about the Halo solution. So how did Halo solve this problem?

A Well, you've heard quite a lot about it already, but I would like to describe it in a little more detail because even though we might be tempted to think that all it is is a linear sum of its components, in order for a complex something like this to work correctly all of the components are compromises.

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 9, 2012
Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC.,	CASE NO: 2:07-CV-331-PMP-PAL
Plaintiff,	CIVIL
vs.	Las Vegas, Nevada
PULSE ELECTRONICS, INC., ET AL.,	Friday, November 9, 2012
Defendants.	(8:15 a.m. to 12:05 p.m.) (1:16 p.m. to 4:42 p.m.)

JURY TRIAL – DAY 4

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
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Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[291] Q [Craig Countryman] And what does it tell you?

A [John Diggins] That some portion of their product is going to come back or come be sold here in the United States.

Q And why does it tell you that?

A Well, primarily you're going to spend a lot of money to develop products. You're going to try to sell them on a consumer market the U.S. If you don't have a UL stamp, you're not going to be able to sell them. So you've got to do that to recoup your finances.

Q And is the fact that Halo's products are UL certified, is that something that you promote to your customers?

A Yes, sir. All the time.

Q Okay. I'd like to talk to you about a little different area, your interactions with customers regarding the patented technology. Are you with me?

A Yes, sir.

Q When you first started working at Halo, had Halo begun selling its patented open mount – open construction surface mount transformers?

A Yes, sir, they had.

Q And do you remember any customer comments from the time when Halo first started selling the patented products?

A Sure. As a part of the design cycle I would go in and see design engineers, and I would always bring my bag of tricks and little samples. And I would go in with the engineer and I'd [292] bring out a sample and lay it on the table, and I would say that Halo has a patented type construction that's called open construction.

And the engineer would pick up the part and look at it, flip it over, and say "Hey, it's open on the bottom. I can see the toroids; I can see the wires. Is this a demo unit?" And I would say, "No, this is a production unit."

Q Did customers suggest to you that that open construction design that that was something unique, something they hadn't seen before?

A In the beginning, yes.

Q Is that not true anymore?

A That's correct.

Q And why is that do you think?

A Well, it's a little more common place these days. You seem to see it everywhere.

Q It's because some of your competitors have also started using open construction design?

A Yeah. I guess others have figured out it's pretty good technology, yes, sir.

Q Now, do you also give presentations to your customers about the Halo patented technology?

A Yes, sir, all the time.

MR. COUNTRYMAN: And I'd like to look at one of those, Mr. Ang. If we could put up Plaintiff's Trial

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 13, 2012

Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC., Plaintiff, vs. PULSE ELECTRONICS, INC., ET AL., Defendants.	CASE NO: 2:07-CV-331-PMP-PAL CIVIL Las Vegas, Nevada Tuesday, November 13, 2012 (8:50 a.m. to 12:02 p.m.) (1:14 p.m. to 4:28 p.m.)

JURY TRIAL – DAY 5

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
Law Clerks:	Kara Rickey/Cristen Thayer
Court Recorder:	Henry Enriquez
Courtroom Administrator:	Donna Sherwood
Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

57] BY MR. ADKISSON:

"QUESTION: When was the last time you spoke with Mr. Kowalski?

"ANSWER [Alan Benjamin]: The last time? Would have been mid-April.

"QUESTION: Where does he live?

"ANSWER: No, I take that back. It would have been mid-May.

"QUESTION: Where does he live?

"ANSWER: He lives north of Philadelphia in Pennsylvania.

"QUESTION: Is he easy for you to get ahold of?

"ANSWER: Yes. I can – I know his telephone number.

"QUESTION: Can you identify any steps that were taken by Pulse between 1999 and 2007 to avoid infringement of Halo's patents?

"THE WITNESS: No, I have no knowledge. I have no knowledge of it."

BY MR. ADKISSON:

"QUESTION: If we wanted to find out why Mr. Spanner never got a reply, who would be the best person to ask?

"THE WITNESS: Presuming that John got the letters, all right – provided if he actually

got them, I would imagine the best person to ask would be John."

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 20, 2012
Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC., Plaintiff, vs. PULSE ELECTRONICS, INC., ET AL., Defendants.	CASE NO: 2:07-CV-331-PMP-PAL CIVIL Las Vegas, Nevada Wednesday, November 14, 2012 (8:58 a.m. to 12:11 p.m.) (1:25 p.m. to 4:47 p.m.)

JURY TRIAL – DAY 6

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
Law Clerks:	Kara Rickey/Cristen Thayer
Court Recorder:	Henry Enriquez
Courtroom Administrator:	Donna Sherwood
Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[11] CARRIE MUNSON, PLAINTIFFS' WITNESS, BY VIDEO DEPOSITION

(Began playing video deposition of Carrie Munson on August 19, 2010 at 9:06:08 a.m.)

EXAMINATION

"QUESTION: And you understand that you're here today as Pulse's corporate designee on a number of topics?

"ANSWER: Yes.

"When did Pulse first learn of one of the Halo patents that's involved in this case?

"ANSWER: In 1998.

"QUESTION: Who at Pulse learned of the patent in 1998?

"ANSWER: Ron Shutter.

"QUESTION: Did there come another point in time in which anyone at Pulse learned about one or more of the Halo patents-in-suit other than Mr. Shutter?

"ANSWER: Yes.

"QUESTION: When was that time?

"ANSWER: 1999.

"QUESTION: Who was Michael Bunny? What was his position?

"ANSWER: I'm not sure of the exact title, but it was director of marketing.

"QUESTION: Did there come a point in time in which someone else at Pulse learned about one of the Halo [12] patents other than Mr. Shutter or Mr. Bunny?

"ANSWER: Yes.

"QUESTION: At what point in time was that?

"ANSWER: 2004.

"QUESTION: What happened then?

"ANSWER: John Kowalski received a letter.

"QUESTION: What was Mr. Kowalski's position?

"ANSWER: The president of Pulse.

"QUESTION: Is this the letter that Mr. Kowalski received about the Halo patent you were referring to?

"ANSWER: It is. And I can see I had my year wrong. It was 2002.

"QUESTION: So the next time Pulse learned of one or more of the Halo patents after Mr. Bunny in 1999 was this letter in 2002?

"ANSWER: Correct.

"QUESTION: What steps did Mr. Kowalski take with regard to the Halo patent after receiving Benjamin Exhibit 11?

"THE WITNESS: My understanding is that until the second letter, I'm not aware of any communication that happened or any actions that took place.

"QUESTION: Did Mr. Kowalski receive the letter that is reflected here in Benjamin Exhibit 12?

"ANSWER: I don't know that he received the letter.

[13] "QUESTION: Do you have any reason to believe that Mr. Kowalski did not receive the letter that's shown in Benjamin Exhibit 12?

"ANSWER: No.

"QUESTION: What steps did Mr. Kowalski take with respect to the Halo patent after receiving the letter that's shown in Benjamin Exhibit 12?

"THE WITNESS: Mr. Kowalski contacted Victor Aldaco.

"QUESTION: Is Mr. Aldaco a lawyer?

"ANSWER: No.

"QUESTION: What did Mr. Kowalski discuss with Mr. Adalco?

"ANSWER: I don't know.

"QUESTION: Did Mr. Aldaco look into it?

"ANSWER: Yes, Mr. Aldaco did a cursory search of the patent and was skeptical as to

its validity based on his knowledge of prior art that we had and his remembering the part that we had developed 30 years ago that he actually was personally involved in doing tests or something as a young engineer.

"QUESTION: What part was that?

"ANSWER: It was the PE6508 – 60584.

"QUESTION: Did Mr. Aldaco find any other prior art that caused him to be skeptical of the validity of [14] the Halo patents at that time?

"ANSWER: He didn't look for any more prior art.

"QUESTION: So the sole reason for Mr. Aldaco's skepticism about the validity of the Halo patents was the prior Pulse part that he had worked on, PE60584?

"THE WITNESS: No. His statement to me was that he had knowledge of that part and also of several transfer molded parts that Pulse had done over the years in addition to Fil-Mag and Valor, who would all have prior art.

"QUESTION: What were the transfer molded parts that Mr. Aldaco believed were prior art, causing him to be skeptical of the validity of the Halo patents?

"ANSWER: Did I say transfer molded?

"QUESTION: I think you did. I thought you listed some transfer molded parts, some Fil-Mag parts before.

"ANSWER: Mr. Aldaco had knowledge of open header parts that we had done over the years, many of them, in addition to open header parts that Valor and that Fil-Mag did. So it was his belief that we had done several products over the years that show prior art to the claims in the patent.

"QUESTION: Were there any printed references that Mr. Aldaco relied upon at that point in 2002 in [15] thinking that the Halo patents weren't valid?

"ANSWER: Not to my knowledge.

"QUESTION: Do you know whether there was anyone at Pulse that made a conscious decision that it was permissible to continue selling open header surface mounted transformer products after Pulse received the letter, Benjamin Exhibit 12?

"ANSWER: I'm not aware –

"THE WITNESS: I'm not aware of anyone in the company that I know of that made a conscious decision.

(Video ends 9:12:35 a.m.)

MR. MELSHEIMER: Your Honor, that concludes the Plaintiff's offer, and may it please the Court and the ladies and gentlemen of the jury at this

time that Plaintiff, Halo Electronics rests the presentation of its Case-in-Chief.

THE COURT: All right. Thank you, Mr. Melsheimer.

At this point, ladies and gentleman, the Plaintiff having rested its case and there were a couple of matters we took up this morning before moving forward, but the Defendants will now present or begin the presentation of Defendants' Case-in-Chief on behalf of Pulse Electronics. So, Mr. Sipiora, you can proceed with your first witness, sir.

MR. SIPIORA: Judge, according to what we discussed this morning I have a Motion to hand up.

* * *

[42] Q Can you just briefly give us some examples of what those would be?

A [Alan Benjamin] Well, as an example, we've talked about Shasta, all right? So, we've talked about other open header, you know, type products that we could move to. We could move to an open-frame construction; we could move to a pour-fill construction. We could move to a side fill construction. We could even move to a molded, to a transfer molded type of construction.

Q Now, this case was filed in 2007. It's now five years – more than five years later.

A Right.

Q Why hasn't Pulse moved its design of the products that are accused from the accused design to any of these other alternatives?

A Because it's a good design. And, you know, we – like many of our packages, like Shasta, which we've had for quite some period of time and we continue to have, this open-header design we feel we invented in the 1980's and 1990's and we brought it forward. It's a good package, and it's useful, it serves a variety of purposes, and why wouldn't we use it?

Q All right. Let's talk about a couple of letters and switch gears here to letters that were transmitted from an attorney for Halo back in the 2002 time period. Are you aware of these couple of letters we're talking about from 2002?

A I am now.

[43] Q Okay. If you could – these have been admitted, so we can – look to your notebook, and if you'd pull up PTX91, please?

A Okay.

Q This is a letter dated July 9, 2002, from Trial and Technology Law Group to John Kowalski, who was then president of Pulse Engineering. Is it true that Mr. Kowalski was your predecessor?

A That's true.

Q And at this time of this letter, July 2002, what – where were you within the Pulse organization?

A Let's see; July 2002 I would have been over in Carlsbad, California, running Excelsis.

Q Is it the case that, then, you would not have been in the group for this letter, you would not have been a person that would have been involved in any response or consideration of the letter?

A Correct.

Q All right. Now, fast forward to 2010. When was the first time you learned of these letters, this letter and the one that follows?

A The first time I saw this letter and the letter that follows was at – was at the deposition hearing in 2010.

Q Okay. And your deposition.

A Yes, correct.

[44] Q Is that right? Now, you were asked certain questions about this letter, correct?

A Yes.

Q Okay. And one of the issues was did Pulse ever respond to these letters, correct?

A Correct.

Q All right. Now, do you have any understanding whether Pulse did respond to these letters?

A No, I do not.

Q All right. And, in fact, the record is that Pulse did not respond to these letters.

A Okay.

Q All right. Does it surprise you that Pulse did not respond to these letters?

A No. Not at all.

Q Why do you say that?

A Well, from reviewing these letters, it's – you know, had they come to me and had I been in the position or had they come now, I wouldn't have responded to them either.

Q Let's take them one at a time. The first letter comes in; it was July 9, 2002. How do you react to this letter? What's your response to this?

A This – they're trying to sell me something. Right? So, this is the letter that says, you know, they have something for which they want to sell me. So, this is like hundreds of [45] letters I get a week where people want to sell me something.

Q Let's take a step back. In the field of technology, and in particular with respect to patents, is there a known methodology or procedure for putting someone on notice of a claim of patent infringement?

A Sure.

Q Is there a –

A Absolutely.

Q Is there a particular kind of letter that people send that's well known and has a name?

A Yes. You would get a – you would get a what's called a "cease and desist letter."

Q Okay. What –

A And –

Q – what's in that kind of letter?

A You – it's a very standard kind of letter, right? And I might even refer to it like a form letter. It's not subtle. You don't have any guess as to whether this is a cease and desist letter. It tells you that in the heading of the letter. It doesn't suggest that you "may" be infringing on a patent; it doesn't say you haven't completed your work, which I'm reading the second letter, right, where they say they've still got work to do. So, it's very obvious. When you get a cease and desist letter, it's very obvious. And coming from a law group, I have to assume that these lawyers knew exactly what they were doing. [46] So, if they wanted to put us on notice, if they wanted to send us a cease and desist letter, they would. But this is clearly – neither one of these letters are clearly a cease and desist letter.

Q All right. Let's – on the first letter first, what's your takeaway from the first letter of July 9?

A They're trying to sell me something.

Q All right. So –

A And if I look at it and they say, "We have" – "We have some technology; you may be interested; would you be interested in buying it?"

Q All right. In your view, it would have been appropriate not to respond to that letter.

A You know, I – you can certainly make an argument that you could send back a nice letter that says, you know, "We've received your proposal; we've looked at – we've looked at our own needs and we don't have need for it." But, you know, like I said, I get lots of letters like this every week. So, I don't – I wouldn't necessarily feel the need to respond back. I could have, but I wouldn't necessarily feel the need to.

Q If this had been a letter of the type that you described as a cease and desist letter, is that the kind of letter that you would expect a response from?

A Absolutely.

Q And is the kind of letter that you would, as a business, [47] as Pulse, in your experience there, would have responded to?

A Yes. Certainly.

Q Okay. Let's go to the second – PTX092, please.

A Okay.

Q Now, this is the second letter in the sequence, and, again, the evidence is that there's no response to this letter.

A Right.

Q From your perspective as a representative of Pulse here, do you consider it appropriate not to respond to this letter?

A Even more so than the first one.

Q Why do you say that?

A Well, because this letter is – you know, in this particular letter they are saying that they haven't yet reached any conclusions; they haven't – you know, they're still – there's a lot that they haven't done here. So, I read this letter and say they have not yet done their homework.

Q And when you say that, can you specifically point to where you're getting that in the letter?

A Sure. In the second paragraph, the third line, starting: "Halo has not yet reached any conclusive determinations as to whether your company's products are covered by its patents."

Q Would you ever see that kind of a statement in a cease and desist letter that was accusing you of infringement?

A Never.

Q All right. Why not?

[48] A Because they would come flat out and say, "We believe that you are infringing on our patents."

Q And what do you infer from this kind of a statement in a letter that comes from a competitor?

A Well, as I said, it looks to me like they have not yet done their homework. They haven't done their homework. So, I – I would look from this either one of two things. Either they don't want to go through the trouble, they don't want to go through the expense, they don't want to – for some reason they just simply haven't done their homework and they're hoping that we would do it for them; or, it's possible that they did their homework and they don't like the answer. Right? The answer is not a good answer for them. And, so, they write this letter in the hopes that we will, you know, give them some information or give them some money or give them something, because they don't like what they saw.

Q How difficult, in this time period, 2002 – how difficult would it have been for this law firm or for Halo to have obtained a Pulse part of the type that's been accused and evaluate it to determine whether or not the product's infringed?

A It would have been very easy for them to get those parts.

Q Why is that?

A Because they would have been available from a number of electronic distributors, and you could

have – you could have [49] fairly easily gotten parts. There's been cases that we've had to go to some fairly extreme measures to get parts. That's not one of them. This – these parts would have been easily available in the market.

Q We can take that down, please. Thank you.

With respect to this notion of receiving cease and desist letters, you mentioned earlier that you have received cease and desist letters on occasion in the past. Is that right?

A True. Right.

Q And has Pulse also sent these type of cease and desist letters?

A Yes, we have.

Q All right. Is it the case that when Pulse engages in negotiation or discussion relating to a incoming cease and desist letter that it actually tries to engage and resolve matters?

A Yes, we do.

Q At some point in time did Pulse receive a cease and desist letter from a company called Mirada (phonetic)?

A Yes, we did.

Q When was that? What time period is that?

A That would have been – this is a guess – probably two, three years ago.

Q Okay. And did the letter say or accuse Pulse of . . .

* * *

[52] filed the – we filed the case.

Q Did you, in fact, then, as a result of this filing the declaratory judgment action and the complaint, which is 556, resolve the matter with Mirada?

A Yes, we did.

Q What was the end result?

A We ended up paying them a fee.

Q Okay. So, you licensed their technology.

A Correct. We ended up licensing their technology.

Q Okay. We can take that down, please.

You're aware in this case that Halo has accused Pulse not just of infringement, but of willful infringement. Are you aware of that?

A I am aware of that.

Q And, you know, in a shorthand, willful infringement is a knowing and intentional violation of the rights of someone else in the context of patent infringement. Do you understand that?

A I do.

Q And initially the complaint alleged in this case and the allegations alleged that Pulse had willfully and knowingly infringed six Halo patents.

A Right.

Q And now today, in this Court, the jury is being asked to consider the few that are left –

A Right.

[53] Q – and an allegation that Pulse knowingly, intentionally is violating the rights of Halo.

A Right.

Q What is Pulse's reaction to that accusation of willfulness?

A We disagree vehemently with that accusation. All right? At the end of the day, we firmly believe that we have invented this technology, and we did it ten, 15 years before these patents in question. And, so, the notion that we willfully infringed upon their patents, we don't believe that they should have patents. We believe that these patents are invalid. We hope to show you enough drawings and testimony that you will look and that you will agree with that.

Q You are aware that in this case Judge Pro had made an earlier determination as to one product, as to one claim, that there was infringement. You're aware of that?

A I am aware of that.

Q How has that impacted or has it impacted Pulse and your thinking about this case, if at all?

A Well, I also understand that the judge was quite clear that it is up to the jury to determine the validity of the patents. And if the patents are not valid, there is no infringement. You cannot infringe patents that don't exist.

Q One last point. We've heard in the opening, and I think we're going to hear in the closing, that a number of companies [54] that are competitors of both Halo and Pulse, including E&E and Transformers, Inc., and Bel Fuse, they've taken licenses. They've taken licenses under these Halo patents and they're – and receive payments of royalties. And the question being raised is, if they're willing to do that, doesn't that show that Pulse is recklessly disregarding the rights of Halo? Why is it that you're sitting here today and Pulse has not sought and taken a license with respect to these Halo patents whereas some of these other companies have chosen to do that?

A Right. I understand that some people have – have chosen to do that. And, quite frankly, I don't – I don't know the terms of the settlements, and I don't know the circumstances for those companies. I do know that in this case the other side is effectively not paying for their legal costs, because they have engaged with a contingency arrangement. And these cases are expensive. Right? This case has cost millions upon millions of dollars. And some of those

companies that you've just described are quite small, and they may not have had the capability to defend themselves, and they may have been forced to settle. Now, fortunately, Pulse has had the financial wherewithal to be able to defend itself in this case. But it's expensive. It's really expensive to fight these things. And it's been a burden. It's been a hardship on the company. It's – it's a lot of time and effort.

Q Well, why has Pulse decided to do this? Why is Pulse [55] expending these kind of resources, this time, these employees' time? Why is Pulse here today contesting these allegations of willfulness and infringement?

A Well, because – because we believe – we believe deeply that we invented this technology. And we believe the people that I talk about have made tremendous contributions to this industry and specifically to this packaging style that we invented this, that we worked together with Western Electric, we worked with Rockwell, we worked with others, and we invented this package. And sometimes – sometimes, in spite of the fact that it's going to be expensive, you just have to defend yourself. Right? You have to be able to fight for what you believe is fair and what you believe is right. And this is one of those cases.

MR. SIPIORA: Mr. Benjamin, no further questions. Thank you.

THE WITNESS: Thank you.

THE COURT: Thank you. Mr. Melsheimer, you may cross examine.

MR. MELSHEIMER: May I obtain the flowchart, your Honor?

THE COURT: Sure.

* * *

[130] from other groups to work and solve problems?

A [Victor Aldaco] That is correct, yes.

Q Would you have a manufacturing representative as part of the problem solving if you had a design problem?

A That is correct.

Q And how long has that been the case at Pulse?

A To the best of my recollection I would say since I joined San Diego that has been the practice.

Q You've been with the company for 38 years. The company makes thousands of products. Are you generally familiar with the kinds of products and particularly transformer products that have been made by Pulse over the course of your career there?

A I consider myself to be very, very familiar with the products, as I see them in production, I see them inside, I see them as a quality engineer, and interacting with customers, so yes, my answer is yes.

Q And is it the case that during the entire time that you've been at Pulse for a 38-year period approximately that Pulse during that entire time, in addition to making other parts, always has manufactured, designed, and engineered transformer products?

A Amongst other products, yes, it's always been transformers, ever since I can remember since I joined in 1974.

Q All right, I'd like to you talk to you now about a product [131] that was developed by Pulse, a number of products that were sold for a company called Western Electric. Are you familiar with that?

A Yes.

Q Now, the products that we're talking about, are you familiar with their transformer products?

A Yes.

Q Were there a number of products that were designed and manufactured and sold for Western Electric in the time period of the 70s?

A There were six products, if I can recall, yes.

Q All right. Do you have personal knowledge relating to those products?

A Yes.

Q What is the basis for your knowledge relating to the Western Electric products?

A Well, I was part of the group that worked on building the first samples and I was responsible with (indiscernible) to build products, check the samples, do electrical inspection, do visual inspection, before the product was shipped to the customer to get initial approval before we get (indiscernible)

Q Approximately what time period are you talking about with respect to your involvement with Western Electric products?

A That was from the beginning of 1975.

THE COURT: I'm sorry, '75?

[132] THE WITNESS: '75.

BY MR. SIPIORA:

Q You, I believe, are familiar with Western Electric, can you tell us briefly, tell the jury a little about your knowledge of who Western Electric is as a customer?

A Well, it was the manufacturing side of what now is AT&T. They used to build every single phone (indiscernible) in the United States.

Q So a big customer?

A A big customer.

Q So it was AT&T, Bell Systems, right, and they had all the phones in the United States?

A Yes.

Q And then there was a divestiture in the 1980s by virtue of a Court order?

A Yeah, they broke into the Baby Bells and now we don't know much about them, but we know about AT&T.

Q But before that in the '80s when that happened, all of the phones in the United States, if you had an AT&T phone or an AT&T system, they were from Western Electric, correct?

A Correct, yes.

Q All right, so it would have been every household that had a phone?

A Anybody who had a phone, it was a Western Electric. Even the public phones were Western Electric. (indiscernible) [133] surprised to see some of those phones still have Western Electric (indiscernible).

Q And the products that we're talking about, they were designed and developed to be sold to this company that we're talking about, Western Electric, correct?

A That is correct, yes.

Q All right. So if you could, please, turn to your notebook, Exhibits 575 through 580, and just briefly let us – after you've had a chance to look at these, make sure you're familiar with these, are these – tell us what these are.

A These are the actual manufacturing drawings for the six (indiscernible), yes.

Q For the – I'm sorry, for the what?

A For Western Electric. These are the six drawings for the Western Electric transformers.

Q All right. Now, are these drawings that were kept by Pulse in the course of its business?

A Yes.

MR. SIPIORA: All right, your Honor, I move for the admission of 575 through 580.

THE COURT: Any objection to 575 through 580?

MR. MELSHEIMER: None at all, your Honor.

THE COURT: All right, thank you. Those will be received.

(Defendants' Exhibits Numbers 575, 576, 577, 578, 579, and [134] 580 were received in evidence)

BY MR. SIPIORA:

Q Mr. Aldaco, each of these sets of drawings, 575 through 580, relate to a different Western Electric part, isn't that right?

A That is correct.

Q Is it the case that from a mechanical point of view, a physical point of view, that all of the designs are essentially the same?

A I would say from a mechanical point of view they are all identical.

Q And if we talk about the package, which we know is the issue here in this case, the package for the transformers, is it the case that all of these designs, 575 through 580, they're all the same package mechanical design?

A Yes, they all use exactly the same open header, they all have multiple transformers, they all have silicone to retain the coils, yes.

Q All right. So –

A The same basic mechanical construction, yes.

Q So if that's the case, why were there six actual parts? Why were six separate parts made if the same mechanical design was going to be used?

A The basic difference between them is electrical. Some of them have two wires wrapped around the toroids, some have three [135] wires wrapped around the toroids, some may have ten wraps around, some may have eight, some may have fifteen. So it's just basically electrical differences.

Q So for purposes of our discussion today would it be fair if we're going to talk about the open package or the mechanical design that we could pick one of

these and it would be a good exemplar, it would apply to all six of them?

A Yes.

Q All right, if you could go to 580.

MR. SIPIORA: And if we could publish that to the jury, 580.

THE COURT: Donna, is that shifted over to –

THE CLERK: Yes, sir, it is.

THE COURT: Okay, great.

BY MR. SIPIORA:

Q Mr. Aldaco, we've seen a couple of these kind of in passing during the course of the trial to date. What I'd like for you to do, if you would, please, is to walk us through 580 –

A Okay.

Q – so that we can understand what – to begin with there's eight pages, is that right?

A Yes.

Q Okay. And how many drawings are actually here?

A What's it's actually – just to explain it better, the [136] drawings are actually twice as big as one of these pages, so every two pages is one page of the actual drawing.

Q So just as an example, the first page of Exhibit 580 when you're looking at it is the left half of the drawing and the second page of the exhibit is the right half of the drawing, is that right?

A That is correct, yes.

Q And if you proceed through 580, or any of these other exhibits, you'll find eight pages –

A Yes.

Q – comprising four drawings, one drawing reflecting two pages, the next two pages another drawing, and so forth, is that right?

A That is correct, yes.

Q Okay, so it's hard to see. If you could just go to the left, let's start at the left. What I'd like to do is walk through the left-hand, let's start with the left-hand side, and blow up the top, and if you could just tell us what we're seeing here, just explain what this is. How does Pulse maintain this record, what does it show?

A Well, first thing, what you're going to see on the first page right on top, you'll see who the customer is, which is Western Electric. You will see the part number, which is PE-60589. Then down below you look where it says rev, basically that is the revision level, which is letter F, and [137] the date of the revision F, which is September 10, 1980.

Q By the way, you've looked at these drawings, is the latest date on any of these drawings September of 1980?

A That's the latest revision of the drawings, yes.

Q Okay. And some of the dates go back to how early?

A They should all go back to 1975, which was the original date.

Q Okay, we'll see that again. Let's go – explain what's next. The list of materials; what's that?

A So as you go down you'll see what is called the list of materials and you're going to see, what is it, seven items, Number 1 being the wound coil, WC stands for wound coil assembly. Then the Number 2 shows the plastic open header. Number 3 shows the –

Q Well, let's just stop there. That's an important point

A Okay.

Q Number 2, 14 pin header case; what does that refer to?

A Yes.

Q What is that exactly?

A That is an open header.

Q Okay.

A It's an open header with 14 pins.

Q All right. Very good. What's number 3?

A Number 3 is – it says Sylgard, which is actually the brand from Dow Corning for silicone, their silicone material. [138] Item number 6 is the solder that is used to solder the wires to the posts. Number 7 is the ink that is used to mark the country origin part number on the top of the unit and the last two items are fluxes that are used to help with the soldering of the wires for the posts.

Q So, is this effectively the list of materials you need to be able to build one of these things?

A Yes, exactly. That's what you need to build one of these products.

Q All right. If we could, Mr. (indiscernible), if we could just – there you go. Thank you.

A So, if I continue down you will see it's a list of fixtures or tools or procedures that will be used or required to help manufacturing people to build the part.

Q All right.

A If we move to the next page, which is actually the right half of the page 1 of the drawing, you have on top some general notes. We have some original drawings that are required to build the product. And in the middle you'll see a block that shows the different revision levels that this part number has gone through ever since revision A, which was released in

1975, and then up to the latest revision F, which was released in September 1980.

Q Right? So – there you go. If you could – so, down below the red – just so we're clear, revisions refer to what? [139] When you look at a drawing like this, you're talking about revisions. What are we talking about?

A The engineering provisions or changes. Something changed on the drawing.

Q All right. So, the initial drawing A, that would have been the initial development of the product. Is that right?

A Yes. Normally every part that we release when it's a formal release it goes to revision A. That is the first revision. Means it's the first time that the part went to production.

Q Okay. And then subsequently, B, C, D, those are revisions to the design. Is that right?

A That is correct, yes.

Q And it says – you see, and is that engineering change notice?

A That is the engineering change notice and it has the number and it has a record who approved and when was it approved.

Q Okay. And the highlighted text here is the date. It's hard for me to see it, but –

A Those are the release dates for each of those engineering changes.

Q And if you go a little bit to the right that you can see maybe better, Mr. (indiscernible), just to the right of that, you can see a little better some dates. There you go.

[140] A After the first one will be – looks like May 19, '76.

Q '76.

A Yeah.

Q Okay. And if we could push that back in, please, and then go down to the block in the middle there. You see it says drawn?

A Yes.

Q And it says Pacho, I think. Who's Pacho?

A Yeah, Pacho is better known as Aurelio Gutierrez.

Q Aurelio Gutierrez?

A Aurelio Gutierrez, yes.

Q Is he an employee of Pulse?

A He's still an employee of Pulse.

Q And down below that, if you could identify the next. It says – well, tell us what it says.

A It's actually Art Proctor. His real name is Robert Proctor. He was the head of engineering, the design engineering group back when.

Q And to your knowledge, what was Mr. Proctor's role in this particular design of the product?

A He was the designer. He was an electrical engineer. He's deceased now, so he was the electrical engineer responsible for the electrical design of the product.

Q Was that date in 1975?

A Yes. I believe it's like 11/21st 1975.

[141] Q This product, Western Electric, you can see the name, was this product made for other customers?

A No. No, normally we have two types of product. We build what we call custom products, which are made for one specific customer or we have catalogs which are offered to all customers.

Q And is this part, the Western Electric parts we were talking about, these were custom made in conjunction with Western Electric. Is that right?

A They were. Yes, sir, custom made. And if you – because if you go back to the first half of the page, right on top says customer Western Electric. So, this was specifically done for Western Electric, yes.

Q And would that have been done in conjunction with Western Electric to develop this part?

A Correct.

Q Okay. All right. So, that's the first drawing. Can you go to the third page, which is the left hand side of the second drawing? If you'd briefly tell us what's shown there.

A This page shows actually is all of the – some of the winding information and there is – you see there is a note that says "CWC1-60589 for latest design." Basically, those one (indiscernible) instructions were changed or replaced during the revision F of the drawing for a stand alone drawing. But this is the original winding instructions that shows how many [142] wires are wrap around the core, what wire is used, the color of the wire, how many turns, and it shows a schematic which is – what you see on the top is the schematic which how many wires are wrap around the core.

Then in the center you see the round thing is the actual ferrite cord with the wire wrapped around the core showing their red natural colors. At the bottom is a specific winding instructions for the winding operator which tells them how the part should be wound.

Q Okay. And that circular object we looked at, that's the toroid that's the center of the – that is the transformer after it has been wound.

A That is the transformer coil, yes.

Q Okay. If you could, go to the second half of this drawing, then, which is the right half of the second –

A So, this one shows the actual – the plastic open header with the transformers loaded into the cavities. The wires are routed and wrapped around the solder posts. Then on the side there's – then there is a side view that shows the pins molded into the header. It shows the position of the transformer. It shows in the center which is label it as stand off, show's the plastic stand off on the center. And that shows the elevation of the pins and how the wire is wrapped around the solder posts.

Q The orientation that we're looking at this, you see the [143] open header casing, from what perspective is that being viewed?

A Well, the left side is the bottom view. It's looking at it from the bottom.

Q Would that be equivalent to a view looking at it from this direction?

A Like that. Exactly. So, it's looking at it from the bottom, yes.

Q And if you look at those circular rings there, those are the toroids?

A That is correct.

Q And the wire wrapped around.

A Yes.

THE COURT: For the record, the model you're holding up, that bears what exhibit number?

THE WITNESS: 499.

THE COURT: 499. Thanks.

MR. SIPIORA: Thank you, your Honor.

THE WITNESS: And the figure on the side is actually is the same package but look at from the side.

BY MR. SIPIORA:

Q And that would be the side view of said stand off. That would be looking at it from this location.

A Exactly. Yes, looking at it from the side, yes.

Q And it references the stand off. It also references silver. What's that a reference to?

[144] A That's references to the silver that is used to retain the coils into the cavities of the open header.

Q All right. And then down at the bottom it says assembly view. What does that refer to?

A Well, basically that assembly view refers to those two figures on the top and then down below there is the specific instructions to the assembly operator on what sequence to follow to build this transformer.

Q Okay. Great. Let's move along, then, quickly to the other two, because I think there'd be less discussion on these; the 5th and 6th pages in, which were the third drawing.

A This will be the left half of the third page of the drawing and this refers to all of the electrical testing that is to be done in production and by quality before the product is shipped to the customer. So, that's to make sure that we have the correct number of wraps around the core; that the wires are connected to the correct pins or terminals. It shows that electrically the part is functioning, it's working, and it's (indiscernible) what the customer wants.

Q Is this the kind of thing that you were engaged in when you were working with the product in '75 to '77 time frame?

A Correct. I was responsible to train operators on how to test the product and if we continue with the next page, I was also responsible to train the quality inspectors on all of the mechanical evaluations in visual and mechanical inspections [145] that needed to be done to the product before the product was shipped to the customer.

So, if I move to that page, what it shows the first square on top it actually shows that one is a top view. You're looking at it from the top is actually where we have the part number; we have where was the part assembled; and which week of the year the part was built. Then we have a schematic that shows what wires are connected to what pins or terminals on the header.

Q So, the top you were talking about is the left hand side where it says 2656N. That would be looking down at the top?

A You're looking at it from the top, yes.

Q And down in the middle there, where are those views that are shown?

A Those are side views; one from the side of the terminals and the other side from the side of the stand off.

Q Okay. Very good. And let's go to the last one, which are the last two pages of 580. Can you briefly tell us what's shown here?

A This is a stand alone joint that's just for the winding. This is a change that was done. If you look at the revision labels of the top level joints as revision F, this was added to the bill of materials which is a separate drawing.

Normally this happens when you're building a product in very high volumes you cannot afford to have the winding [146] operators on the line because you have too many. So, you have to create a separate drawing so that you move those winding operators to a separate side – separate place in the factory and they can actually build those transformers, those coils, bring them into the production lines.

So, this is what it is. It's the winding instructions. It shows again on the top shows how many wires, what colors, what size, and it shows how many turns and whenever you wrap around the core on the next half the right half of the drawing it shows in the middle shows the core with the wire wrapped around the core.

On the top it shows the revision level of this drawing. On the center portion shows the bill of material, what is needed to build this part. Basically it's item 1 is the core, item 2 and 3 are the red and green wires. Then on the bottom we have the title, which is what it is – a description of what it is, which is a toroid coil sub assembly. The part number that you see 1-60589 and in the center is the description as to who participated on the design of this part.

Q Very good. Mr. Aldaco, based on your personal knowledge, did Pulse manufacture these parts, these Western Electric parts, during the time period 1975 to 1980?

A That is correct, yes.

Q And how do you know that?

A Well, first of all, is that we would not make any changes [147] to a drawing if the part is not in production. So, just by looking at the drawings we made at a minimum we built the product from 1975 to 1980. That was the last time we made a change. So, that shows that the part was in production.

Q All right. Do you have personal knowledge that that part's actually being in production?

A Yes. I was at the factory that was building the product.

Q What kind of volume are you aware of having been manufactured with respect to these parts?

A I don't think I can give you specific numbers. All I can say is we have people back when in Mexico people used to work 48 hours a week. So, we have two shifts of people working six days a week, 48 hours a week, two shifts and we were doing this for at a minimum five years.

Q Based on that knowledge and the volume of production, approximately how many parts – can you approximate how many of these Western Electric parts were manufactured and sold by Pulse to Western Electric during the period '75 to '80?

A I don't think I could give you a specific number. That would be lying. And I'll say what I know is that we built hundreds of thousands if not millions of parts.

THE COURT: All right. This would be a good time to take our luncheon recess. Ladies and gentlemen, we'll be in recess until 1:25. That's an hour and 15 minutes. During this luncheon recess, please remember that admonition. Refrain from . . .

* * *

[155] THE COURT: – your corporate representative, I think.

MR. SIPIORA: Absolutely. Oh, absolutely. The only thing is if we have a half an hour at the end of today, we might –

THE COURT: Yeah, okay. I think – we may be able to stay a little late.

(Jury entered the courtroom)

THE COURT: All right. Have a seat everybody. All members of the jury are now present. With that big lunch you ate, I'm going to keep my eyes peeled to make sure none of you start to dose off but I hope you enjoyed it. That's – I was telling the members of the jury this morning – they asked about bringing food and when we have a short trial, a bank robbery for two days or something, they don't even get to know each other. But whenever you get into a second week, the jurors tend to bond and pretty soon, they're bringing in food and cheesecake, and stuff I think. Even Donna can attest to how good the cheesecake was I think, so. All right. All right, you may proceed, Mr. Sipiora.

MR. SIPIORA: Thank you, your Honor.

DIRECT EXAMINATION (CONTINUED)

BY MR. SIPIORA:

Q Good afternoon, Mr. Aldaco.

A Good afternoon.

[156] MR. SIPIORA: If we could pull up please DIM 13.

BY MR. SIPIORA:

Q Mr. Aldaco, this a list of possible features in a transformer part package. Can you see that?

A Yes, I can see that.

Q And what I'd like to do with you is, the features on the left and then there's a box to the right which says present and there's a question mark. What I'd like to do is walk through with you exhibit 580 which is the Western Electric Part and discuss with you what features of this transformer package are present. And it would actually be, you know, you could check the box. All right. So if we could start with –

THE COURT: Before we get into that, let me interrupt for just one second, Mr. Sipiora. Ladies and gentlemen, this is something that I was just addressing with counsel before you came in and wanted to make sure that you understood. What the witness is now going to go through is not an analysis by the witness of the patents, the three patents-in-suit. He's testifying as to features present or not present in the Western Electric Drawings that you heard about before lunch and wanted to make sure that it was clear to the jury that the witness is not offering his analysis of the patents-in-suit. That's the province of you as the jury and of course, will be the subject of testimony as it has already of experts and of future experts.

[157] MR. SIPIORA: Thank you, your Honor.

BY MR. SIPIORA:

Q All right. So, if you could start on the first of 580. We'll just move back and forth between these. And the very first page if you could. And focus on the

very top, part number one, wound core assembly. Mr. Aldaco, wound core assembly, would that qualify as a wire wrap Toroid?

A Yes.

Q Okay. And is that depicted in the Western Electric Drawings?

A Yes, it is.

Q Can we confront it where that is?

A Can you go up to –

THE COURT: Donna, I think you need to turn the audio on. I think it may have turned off. There we go. Thank you. Go ahead, sir.

BY MR. SIPIORA:

A All right. So if we go to page three. Next page.

Q Next page.

MR. SIPIORA: And blow that up.

BY MR. SIPIORA:

A So right there. So you can actually see it. It's on the center. Those two round.

Q Yeah. Can you – I don't know if you can indicate in the screen. I don't know if that. Okay. All right. And those [158] are Toroid's, is that right?

A That's our Toroid Transformers.

Q Okay. All right. And they're wired up Toroid's?

A Yes, Sir.

MR. SIPIORA: All right. Now – and if you could go back to that chart which is DIM 13. Oh, we're going to have an issue.

BY MR. SIPIORA:

Q Do you know how erase, Mr. Aldaco? They didn't teach you that one, I know.

MR. MELSHEIMER: I think if you press the left hand, bottom left hand corner. Mr. Aldaco can clear it.

THE COURT: Donna, you can. I think –

MR. MELSHEIMER: The very bottom.

THE COURT: Yeah. He's got his finger in the right place. Go ahead and clear that, would you? There we go.

MR. SIPIORA: Maybe we'll just stay away from that. We'll just use – use words.

BY MR. SIPIORA:

Q All right. So, wired up toroids was at the bottom. We put a check there, as reflecting it being in the Western Electric. Okay. All right. The next one I want to focus on was within silicone's right next that. If you can go back to 580. Are these wired up toroids in the Western Electric part within silicone?

[159] A Yes.

Q And where would you find that?

A You will see it in this area around and that dotted line shows the silicone.

Q Okay. And is that term Sealguard referring to that?

A Excuse me.

Q The term Sealguard, you see that?

A Yes. Sealguard is the brand name from Bell Horn for silicone.

Q All right. And that's reflected if you go back to the first page of this exhibit.

A Yes. That should be item number two.

Q Item two.

A Item three. It should be item three on the first page. It should be this item. Yes.

Q Okay. Now these Toroids are actually within silicone, they're carried within silicone; is that right?

A That is correct.

Q All right. And how exactly are those Toroids kept in place in that frame, the assembly?

A Well, they – the silicone is used to retain the coils in the open pair.

Q All right. So can we put a check on that box then, if you go back to DIM 13? Okay.

A Yes.

[160] Q All right. If we can move to molded pins. Did the Western Electric Parts, do they have molded pins?

A Correct. Yes.

Q All right. Can you show us where you find that?

A So if you go to the same page that we were before.

Q All right. As the drawing?

A Yes. So there it is – are the molded pins.

Q Okay. All right. So we can check that box as well?

A Yes, correct.

Q All right. Were there notched post? Notched solid post in the Western Electric design?

A Not on the Western Electric, no.

Q Okay. So we can't check that box?

A Cannot.

Q Okay. Was there an open construction?

A Yes, correct.

Q All right. Can you go back and show us where the open construction is shown?

A This same view shows you the header. Look up from the bottom and you can see – you can actually see. This already has a silicone so you can see all of the elements. You can see the wires. You can see the transformer so it's an open construction.

Q Okay. So we can check that box?

A Correct.

[161] Q Now with respect to parallel solder post. Are there solder post that are parallel to the side walls in this design?

A Yes, that is correct.

Q Can you show us where that is?

A If I look at this, this ought to be a post. They go parallel to this surface. So it does. Yes.

Q Okay. So it does have parallel solder post?

A Correct.

Q You can check that box?

A Yes.

Q You're making a mess of this drawing.

A I know.

Q Can we –

A Sorry.

MR. SIPIORA: Can we reset the (indiscernible)?

BY MR. SIPIORA:

Q I think we're going to stop the marking and let's just talk because it looks like one of my little kids got loose. All right. Did the Western Electric part have a standoff or standoffs?

A That is correct. Yes.

Q Can you show us where that was present?

A Same page, so this is standoff. Each of those are standoffs. Yes.

Q Okay. Is there actually a reference on the right hand [162] side to the word standoff?

A Yes. So you can see it right there.

Q Okay. So can we check the box that the Western Electric part had standoffs?

A That is correct. Yes.

Q All right. With respect to end solder post. Did the Western Electric park have an end solder post?

A I'm hesitating because it depends on the definition of what end solder post is. In the case of – if we go back to the same page that we were before, this is the section that I will call the end solder post, which is where the water is wrapped around the post and solder.

Q Okay. So would you character – so, I'm going to assume it's solder post, correct?

A Yes.

Q All right. Would you say it's an end solder post? What's your view on that?

A I will say it's an end solder post. Yes. I guess based on the definition.

THE COURT: What does – I mean, by end, you mean the end of the package or does it have some other function that it serves?

THE WITNESS: Well, yes Sir. That's what I mean when I said it depends on the definition. It's this is the end of the post when I look at it from the bottom. So from the bottom [163] to the top is the end.

THE COURT: All right.

THE WITNESS: Okay. On the surface mount, if I were to – can I mark on this drawing?

THE COURT: Sure.

THE WITNESS: If I were to do a transition from this part to a surface mount, I would actually bring this pin this way and make a gold wing in which case I eliminate this portion of the pin and this there has become the end post.

THE COURT: All right.

THE WITNESS: It depends on your definition so.

BY MR. SIPIORA:

Q All right. Could we place a question mark around "inside of post" for now just depending on how you define "inside of post?"

A Yes.

Q Is that fair?

A That's fair. That is a fair, yes.

Q Okay. And there are two other – if you go back to that list, there are two other items that are identified, two other features. You've got a notch-sided post, we have a no check, in the inside of post we have a question mark. There are two more. Surface-mount package. Is this a surface-mount package?

A No, this is a through-hole package, so none of those two look like it.

[164] Q All right. And a surface-mount lead, that also would not be present; is that right?

A Would not be present, no.

Q Because this design was a through-hole design; is that right?

A That is correct, yes.

Q All right. So to sum up with respect to the Western Electric part, looking at the features that we've been describing, it has wire-wrapped toroids that are within silicone, it has a standoff, it has

parallel solder posts, it is open construction with molded pins. Is that accurate?

A That is very accurate, yes.

Q Okay. Now, this issue of – on –

MR. SIPIORA: Will you take this down, please.

Q This issue of through-hole construction, the jury has heard a lot about it, I'm not going to revisit it, but was it the case that in the time period of the '70s, that the predominant method of affixing the package to a printed circuit board was the through-hole method?

A That was the predominant technology, yes, in the '70s.

Q And that's when this part was designed?

A Correct, yes.

Q Now is it the case that you observed as someone in the industry there was an evolution from through-hole to other designs?

[165] A There was an evolution in the '80s, yes.

Q All right, and what –

A Some of our customers started transitioning from the through-hole to the surface-mount technology, yes.

Q And the jury's heard, just but briefly, is moving that transition from through-hole to surface-mount involves a lot?

A It is actually changing is on a through-hole part. Basically it means you have straight pins that go through a hole on the PC board and the parts are soldered on the bottom of the PC board. When you're talking about a surface-mount part, it actually has a – the leads form what we call on a gull wing that they're designed to sit on the surface of the PC board and they're soldered on the top of the PC board. So that's basically the main difference. Package, electrical, everything is the same. It's just whether the pins are straight and go through the hole or they sit on the surface of the PC board. That's the basic definition.

Q All right, so it's been used as an example before, but if this is a printed circuit board (indiscernible) the through-hole the soldering go underneath –

A It's on the bottom.

Q – in this design (indiscernible) it still on the top, up here.

A That's correct, yes.

Q So, was it the case that Pulse had a number of through-[166]hole products through the 1970s, such as Western Electric?

A Correct.

Q And did Pulse develop surface-mount technology and use that for mounting of transformer products and packages in the '80s?

A That is correct, yes.

Q And did, in fact, Pulse have products that were through-hole design that transitioned to surface-mount when the technology evolved?

A Yes, we actually had offerings for the same electrical part in both through-hole or surface-mount.

Q Well, let's talk briefly about some of the surface-mount technology. Before the 1995 date of the filing of the Halo patent, did Pulse have a number of surface-mount products that were on the market and available for sale?

A That is correct.

Q All right, so let's pull up – briefly let's talk about a few of these, 526 – which I might – well, I offer 526. It's the Rockwell.

THE COURT: Hold on just a second, is there any objection to 526? I don't know if that's been previously received.

MR. MELSHEIMER: No, your Honor, there's not.

THE COURT: All right, 526 will be received then.

(Defendants' Exhibit Number 526 received in evidence)

[167] BY MR. SIPIORA:

Q So, Mr. Aldaco, if you could turn to 526 in your binder, and we have it on your screen as well. Are you familiar with this part?

A Yes.

Q This is the Rockwell PE64309?

A Correct.

Q All right. Is this – what's the date of this product, or this drawing say?

A If I look at it, it is – it was signed by Mike McWilliams (phonetic) who was the electrical designer, and approved by Sao Paulo in September 1st, 1986. I believe that what it says here. Actually if I look at the revision A, revision A on the upper block and the middle block, on the left – on the right side, revision A says July 21st, 1986.

Q All right, are you familiar with generally with the Rockwell part?

A Yes.

Q You were involved in testing and qualifying this part when it was being developed?

A I don't think so.

Q Were you aware of its development when you were at Pulse?

A Yes.

Q Who was the person at Pulse with the most knowledge about this Rockwell 64309 part?

[168] A It's Jim Lint who was a mechanical engineer.

Q Okay. Is this a surface-map package?

A Yes, it is. And actually it says right above the part number on the bottom, right corner, it says, "surface mount Pulse transformer."

Q Okay, all right. So let's, if you could, go to 644. We need to identify this first.

A Six forty-four is for a surface-mount transformer, part number PE65793.

MR. SIPIORA: Your Honor, I would move for the admission of six – DTX 644.

THE COURT: Any objection to 644?

MR. MELSHEIMER: No, your Honor.

THE COURT: Thank you, that'll be received.

(Defendants' Exhibit Number 644 received in evidence)

BY MR. SIPIORA:

Q So Mr. Aldaco, is this a surface-mount transformer product?

A Yes, as described in the title, it's a transformer surface-mount technology – surface-mount, yes.

Q Is this an open-header design?

A It starts as an open-header. What you see on page number 2 – actually what you're seeing, you're seeing an open-header construction.

Q Right.

[169] A But, it's eventually encapsulated with epoxy.

Q And this design, what's the date of this drawing?

A This is December of 1991.

Q And I notice if you look at – in the drawing at page 2, there's a reference to step nine.

A Step nine is actually – it's one step in the manufacturing process where the leads are form in a gull wing configuration.

Q Referring to that gull wing, can you describe in this time period, the 1991 time period, what are gull wings and how were they used by Pulse?

A Well, they were used on all of the surface-mount products, which it was also the preferred

choice by customers. We used to have what we call the gull wing, which is what you saw on the drawings, which actually has this kind of shape, and they used to be what we called the "J" lead, which is formed like a "J" underneath the package. But this was the predominant –

Q In the Exhibit 499, is this an example of a gull wing surface-mount?

A Yes.

Q Is that what we see in this exhibit DTX 644?

A Yes. If you look to page number 3 on the drawing, it's going to be more clear where it shows the gull wing forming of the pins.

Q Okay. Were you involved in the development or testing in [170] any respect – with respect to this particular product, the part depicted in DTX 644?

A Correct, yes. As a matter of fact, if you go to page number 1 and you look at the block where the signatures are, you'll see my signature. I was the senior quality engineer when the product was developed.

Q Which one of those is yours?

A This one (indicating). That's me. We're looking at it, that's my signature.

Q All right, the date's 12-19-91; is that right?

A Yes, correct.

Q If you could turn to 656, and if you could identify that for us.

A Six – this is a catalogue or datasheet that is used to advertise our products to the world.

MR. SIPIORA: Your Honor, I would move for admission of DTX 656.

THE COURT: Any objections to 656?

MR. MELSHEIMER: No objection.

THE COURT: That'll be received.

(Defendants' Exhibit Number 656 received into evidence)

BY MR. SIPIORA:

A So it describes surface-mount transformers, basically the part number that we sold before, it's listed as part of this part family.

[171] Q Now, that's the PE65793?

A Correct, yes, that is the second part number on the list.

Q And this reflects the fact that it was offered for sale?

A Yes.

Q Can you date this particular products material?

A Yes, if you move to page 2, bottom right corner, right underneath the 906-32, you will see December, 1991.

Q Okay, so we surface-mount, gull wing, Pulse Transformer Products, 1291, and this is backup of the drawings we just saw?

A That's correct, yes.

Q If you could turn to 631, please. Could you please identify this document?

A This is again another catalogue that gets wide distribution worldwide, available to customers and potential users for a – yeah, it includes a lot of products from the different divisions. On the bottom we have LAN, which is Local Area Network, Division Power and Telecommunications.

MR. SIPIORA: Okay, your Honor, I move for the admission of DTX 631.

THE COURT: Any objection to 631?

MR. MELSHEIMER: No objection.

THE COURT: Thank you, that'll be received.

(Defendants' Exhibit Number 631 received into evidence)

[172] BY MR. SIPIORA:

Q First, let's date this if you could. What's the date of the – this Pulse Short Form Catalogue, which is DTX 631?

A If you could to the last page, the very last page, bottom right corner underneath where it says "catalogue 930," right there you'll see is July, 1994.

Q So within that halo, you see 7-94 as the date on this catalogue; is that right?

A That is correct, yes.

Q Now, does this –

A That is the date that it was published.

Q Okay, so you know that Halo filed its patent application in August, 1995, so this is more than one year prior from Halo filing its patent application; is that right?

A Yes.

Q And these products – you mentioned earlier there was two kinds of products generally, two categories: there are custom and there are kind of off the shelf.

A Yes.

Q Is that – is this catalogue –

A This is catalogue, off the shelf, available for anybody who is – has a need or application for the product.

Q All right, let's turn to the pages that are related to the transformers, if you could please, which is about four or five pages back. It starts at I think page 5. You see that?

[173] A Yes, I can see it.

Q All right, would you agree with me that there are four pages of transformer products that are either displayed or offered here?

A Yes, yes, the title on the top says "Transformers," yes.

Q Running through these, they are for different applications. Telecommunications – you highlight the middle of this page.

A Yeah.

Q These are telecommunications transformers. Then it carries over to the next page, correct?

A Yes.

Q On the bottom there's high-frequency LAN transformers.

A Yes, there are some for 10Base-T (indiscernible) applications and general purpose transformers.

Q And these are all transformers of a kind that are being litigated in this lawsuit right now?

A Yes.

Q Okay, so if we could, this catalogue, at the very beginning, if you could highlight the upper left on that page 5, it's – if I could just read it for the record here:

> "Pulse Engineering continues to expand its transformer product line with surface-mount

> and through-hole packages to accelerate in their design development many of the transformers performance [174] characteristics already marked – matched to the leading digital telecommunications and data communication transceiver ICs for wide and local area network applications."

Does this reflect the fact that at this time period, Pulse was offering both surface-mount technology packages and through-hole packages?

A Yes, that is correct.

Q And for consumers who were looking at this catalogue thinking about buying transformers from Pulse, how were they able to determine which were the through-hole construction and which were the surface-map construction?

A Well, it's very simple. If you look at this one page, if you go up to the bottom right corner, right above where it says "Pulse Engineering," you'll see SMP, surface-mount package, highlighted in blue. And then down underneath is the THT, which is a through-hole package. So anything that is highlighted on this page in blue, it's a surface-mount.

Q And then if it's not, then it would have been a through-hole; is that right?

A It's a through-hole, yes.

Q So in this time, Pulse is offering both options in terms of being able to –

A Yes.

Q – mounting on a printed circuit board.

[175] A Customer's got a choice to use same functionality on either through-hole or surface-mount.

Q All right, let's talk about it just for a minute. If a customer had a product from this time period, in the 1994 time period, it was a through-hole design, was it the case that Pulse was able to take that design, retain the electrical features, and convert it from through-hole to a surface-mount design?

A That is correct.

Q All right. Did that actually happen?

A Yes.

Q And how would that happen? How would we take a through-hole design with this electrical appliance for the toroids and the number of twists and so forth, how would you move that from through-hole to a surface-mount application?

A Well, there would be some basic changes. The first main change, as I explained before, you'll go from having straight pins to different pins that will have the gull wing. That will be the first basic change. And, of course, we'll change the type of soldering used to connect the wires because surface-mount products are soldered at much higher temperatures. It will require a higher temperature solder.

Q Could we – if we could go to 580, maybe you can illustrate for us, 580 which is the Western Electric part. If we could go to I guess it's the fourth page in, which shows the [176] – there you go. So this is the Western Electric open-header construction we've been talking about and this is the through-hole. And you can see it's a through-hole because on the right, see that (indicating) –

A Yes.

Q – those pins are straight. What would be involved in moving from this through-hole design to a surface-mount design if you took this Western Electric part in '94 and did that?

A If I wanted to simplify it, basic – can I mark? Can I mark –

Q Yeah, please.

A – on the screen? And I apologize for my chicken scratches, okay, so – so basically what we take is take this pin, change the configuration, bring it over this wall, and then do the gull wing. That would be a basic change. Of course, it's not as simple as that. Instead of going a pin or stick, if this would go to a lead frame there are (indiscernible) pins. But that would be the basic, simple change.

Q And is it the case that Pulse engaged in that kind of changes in their products to move from through-hole to surface-mount in that time period?

A That is correct, yes.

Q If you were to make that kind of move with respect to this product, to migrate the Western Electric part from the through-[177]hole design that we see in 1975 to 1980, and in the early '90s, move that as you did other products to surface-mount, would it – if you go back to demonstrative 13 – would it have some of these other features that we described earlier? For example, would it have a surface-mount package?

A Yes, you'll have both of those. That's – I draw the lead right now, that will make it a surface-mount package.

Q All right, and would it have the surface-mount lead as well?

A Correct, yes.

Q And would it have the end soldered post?

A Yes.

Q All right.

MR. SIPIORA: Okay, if you can take that down. I'm going to change subjects.

Q Well, Mr. Aldaco, your name has come up in connection with a couple of letters. I'm going to talk about them, hopefully not too long. But I think we need to discuss these. You're aware that Halo sent two letters to Pulse in 2002, correct?

A Yes.

Q All right, and if we could go to PTX 91 in your notebook, they're both in evidence. Then there's PTX 92, if you can pull that up perhaps. When did you first learn about these letters?

A Back in 2002.

Q How did you learn about these letters?

[178] A How did I? It was back when Mr. John Kowalski, the President of the company, he came into my office, he showed me the letter. And he wasn't sure what he wanted to do with the letter, but he showed it to me and said, "Can you give me your opinion." And I said – I wasn't sure what he meant because when I read the letter, it was very vague, so I wasn't sure what to do with it, so –

Q Did the letter include the final copy of one of the patents?

A Yes.

Q Do you remember what number patent it was?

A Not off the top of my head, no.

Q All right. Did you take the patent and examine it?

A Yes, I did.

Q All right, did you review it to see whether or not there was any issue with respect to Pulse infringing the patent?

A Yes, I reviewed the patent.

Q And how much time did you spend doing that?

A As I said in my declaration, it's difficult to remember, you know. This are things that happened nine or ten years ago. So to the best of my recollection, somewhere between one or two hours. I would say two hours.

Q Was that sufficient time for you to form a judgment as to whether or not there was an issue with respect to Pulse infringing the patent?

[179] A Yes.

Q All right, what conclusion did you come to?

A Well, first, when I read what his claim is – I just explain the Western Electric. I was reading the – what was claimed; and, as I was reading, I was thinking about Western Electric because everything that is claimed is basically what is included in the Western Electric, except for a couple of features that were not included. So my conclusion was that those – there was no novelty. Those were features that we'd been using for 20 years. So my conclusion was that the patent was not valid.

Q Did you consider any other products other than the Western Electric part? Do you specifically recall considering something else?

A Rockwell. Those – I said those were the two products. We have many open-header-type products, but those were the two that came up.

Q Okay. Now, did you provide a response to Mr. Kowalski in relation to the question of whether or not these products, this letter, this patent, created an issue?

A Once I gave deposition here I – as the same as with the deposition, I was asked this question like two or three, maybe four times. I could not come up with a straight answer. I'm saying it's like did I went and talk to John Kowalski? I should have, and I guess I did. Did I talk to him directly or [180] did I talk to Mr. Joe Elcampo (phonetic), who was my immediate manager? So – but I talked to – the message got across to Mr. John Kowalski either directly or through Mr. Joe Elcampo.

Q So is it the case that you don't remember specifically when you spoke to Mr. Elcampo, your supervisor, or Mr. Kowalski directly, but you do recall that you communicated back –

A Yes.

Q – to them your conclusion?

A That's correct.

Q And what was the conclusion that you communicated?

A The conclusion was that the patent must be invalid because what is claimed we have been using for many, many years.

Q In connection with that review, did you – well, around the time of the review, did you discuss the issue of the patent and the prior art, the technology of Pulse with anyone else at Pulse?

A Again, I cannot say for sure. It makes sense that I talked to the – I had mentioned Jim Lynn, who worked on the Rockwell, and – all I knew was Rockwell. I did not know the number. And I knew that I seen the product introduction, so I could have talked –

Q But do you specifically recall talking to him?

A Not for sure. I'm saying it makes sense that I would have talked to him, but, again, you know, that happened ten years ago, so – I talked to him, I know him for 20 years. We – he [181] sits outside my office, so it makes sense that I may have stepped out and went and talked to him for a minute or two, maybe longer. I don't know.

Q Did you speak to Mr. Pacho Gutierrez (phonetic)?

A Most likely I did. I don't – cannot say for sure.

Q You do recall, however, you looked at the patent, you reviewed it, and you gave your conclusion to either your boss or your boss's boss; is that right?

A Yes, that is correct.

Q Did – in connection with the activity, did you communicate at all with a lawyer?

A I gave – you know, I made my conclusion, I communicated my conclusion to either John Kowalski or Joe Elcampo, and I remember giving a copy of the letter to legal counsel.

Q In connection with giving your recommendation or your advice and conclusion to management, did you rely at all upon legal advice?

A No.

Q Okay.

A It was very obvious after I reviewed the patent and my recollection of what I remembered about the Western Electric and Rockwell. I saw no need.

Q Who – by the way, who else – did Pulse have patent counsel in that time period?

A Yes.

[182] Q Who was that person?

A Robert Kazinski (phonetic).

Q Okay. After you gave your report to either Mr. Elcampo or Mr. Kowalski, did you hear anything further regarding this issue of the letter from – or letters from Halo relating to the particular patent?

A Next thing I heard was five years after, so 2007.

Q Okay, so from the time that you gave your report to Mr. Kowalski or Mr. Elcampo, which was in approximately 2002; is that right?

A Yes.

Q The next thing you heard about this particular issue of the patent was when the lawsuit was filed in 2007?

A That is correct.

Q Now, the letters in front of you, if you can turn to the – particularly the second letter.

MR. SIPIORA: And I wonder if we could get rid of that squiggly, please. Thank you.

THE COURT: It didn't clear, did it? There.

MR. SIPIORA: There it goes, thank you.

BY MR. SIPIORA:

Q Did you – and now I'm looking at this letter, which is the August letter, did you or anyone at Pulse, to your knowledge, consider Halo's letter in 2002 to be notice of a claim of patent infringement?

[183] A No. It's like – again, it's not much different than the first letter. It is longer, but basically it is very vague. It says like, "You may." It says, "Halo has not reached any conclusive determinations." So, again, we were not being accused of anything.

Q Is it fair to say that Pulse took the position – took the statements in the letter at face value. In other words, that Halo was not accusing Pulse of infringement because Halo itself had not determined whether or not there was infringement?

A I think that is a fair assessment, yes.

Q Okay. All right, you can put that back. Just a couple last questions, Mr. Aldaco, you are an inventor; is that right?

A Yes.

Q You're inventor on a patent, right?

A One patent, yes.

Q Okay, all right, in connection with your work at Pulse, is it your practice to keep a record of your activity, in particular your design and development work?

A Yes. It's an engineering practice that one initial engineers, including myself as a director, I have an engineering book where we record all of the results of meetings, the assigned reviews. If we come up with a new design, a new concept, a new approach, we do a formal drawing or chicken scratches. And you reference, sometimes we ask if it is – if it is something that we would need, we would be . . .

* * *

[194] [Tom Melsheimer] opinion on a patent matter?

A Yes. I think that is a correct assessment. That I can remember, yes.

Q Now, he – I mean, he's the pre – he's the top dog at the company, right?

A Yes. He was the president.

Q He was at the time?

A Yes.

Q So, and I think you told us at your deposition that he used to kind of roam the halls and talk to people at the company?

A Yes.

Q But this was the first time he ever brought you a patent and a letter from a competitor of Pulse's and asked you to review this patent to determine if it was a valid patent, right?

A I don't think he asked me to review the patent. He gave me the letter. He asked me for an opinion.

Q So, he – he – he asked you for an opinion about the letter, generally, about the patent in particular, or you're not sure?

A I don't think he was sure, himself, what he was looking for. The letter was not specific and so it was making an offer. He said, what do you do when you get offer so –

Q Well –

[195] A So he wasn't sure what you guys were asking.

Q Sure.

A Neither did I.

Q Well, it was specific enough, though – can – can we agree on this, sir? That it was specific enough to – to send Mr. Kowalski down the halls of Pulse to go seek out one of their most senior engineers and ask for your opinion, right?

A Yes.

Q Now, you're not an attorney. Are you sir?

A I'm not.

Q You're happy about that, I bet.

A Yeah. I will never pretend I am.

Q Okay. And you don't hold yourself out as an expert in patents. Do – do I have that right?

A I'm not an expert.

Q And you don't hold yourself out as an expert in reviewing patents either. Is that fair?

A I have reviewed patents but I'm not an expert. That's the reason why we hire Mr. Kazinski.

Q When you were reviewing the Halo patent, sir, did you – I think you told us you didn't take any notes.

A No.

Q You didn't actually highlight the patent to your recollection, right?

A I don't think I did.

[196] Q You didn't create a file related to your review of the patent, right?

A No.

Q You didn't write down any of the thoughts you were having about the patent as you were reviewing it?

A No. I did not.

Q You think you spent about two hours doing this process, sir?

A Give or take, yes.

Q You concluded after that, based on your knowledge of – of the Pulse products, the earlier products, that the patent must be invalid, right?

A That is correct.

Q I think you told us in your deposition, sir, that you didn't review any legal principles about what makes a patent invalid before you reached this conclusion; did you sir?

A I did not.

Q You didn't look at the file history of the patent to see all of the back and forth that had gone on between the Patent Office and the emitter. You didn't do that either, right?

A They were not available, no.

Q Well, you say it wasn't available and I take it, it wasn't given to you.

A Were not given to me.

Q But, of course, that's something you know, as from your [197] own patent, you know you can go to the Patent Office – anyone can and obtain the file history of a patent, right? You know that.

A I've been told, yes.

Q No one else, to your knowledge, reviewed the Halo patent back in 2002, right?

A Not that I'm aware of.

Q You – you didn't give the patent to anyone else, right?

A I don't believe I did.

Q You didn't give it –

A As I said on my deposition, is I don't think I'm sure whether I did or not.

Q And once you reached your conclusion about this, sir, that you told us about, you don't think – and

I think you were pretty candid about this, with us earlier – you don't think you actually communicated directly to Mr. Kowalski, right?

A I cannot say for sure.

Q You think you may have told it to this fellow, Mr. O'Campo, right?

A That – that is a possibility, yes.

Q But – but you're pretty sure – in fact, you're very sure that you – you certainly told one or the other, right?

A Yes.

Q And, but when you did that, you didn't write it down in a memo, correct?

* * *

[203] said in your declaration, right?

A Yes. And I can read it.

Q And – and back in your – in your deposition you told us that back in 2002, when you concluded the patent was not valid based on your two hour review, that Pulse didn't change anything. They just did what you said was business as usual, right?

A That is the correct statement, yes.

Q And that's the business that usual – business as usual you're talking about there, sir, selling millions of dollars of accused products from 2002 onward, fair?

A I don't think that's what I meant. I said we continued doing what we'd been doing for many years.

Q And the business as usual included selling products that, as you know, Pulse – that Halo's accused of infringement, fair?

A I don't think we infringed anything. We – what I meant I said, we continued doing business as usual, meaning we continued building products built for 20 years. Or 15 years. That, to me, was business as usual.

Q You and I – Mr. Aldaco, you and I aren't going to agree on that but I appreciate your time and thank you for your answers.

THE COURT: Thank you. Any redirect Mr. Sipiora?

MR. SIPIORA: Just a brief couple questions, your [204] Honor.

THE COURT: All right.

REDIRECT EXAMINATION

BY MR. SIPIORA:

Q Mr. Aldaco, the event that took place with respect to Mr. Kowalski, what was the time period of – from the time he provided the letter to you with the patent to the time you reported back to Mr. O'Campo,

do you have an idea, or it's Mr. Kowalski, do you have an idea how much time elapsed?

A Between the time I got the patent and the time I went back to him, I would say within a couple of days.

Q Okay. So, ten years ago, within a couple of days, you spent a couple hours reviewing a patent and giving a report back?

A That is correct.

Q Is that right?

A Yes.

Q Thank you.

MR. SIPIORA: No further questions.

THE COURT: Thank you. Anything else?

MR. MELSHEIMER: No, your Honor.

THE COURT: All right. Thank you, sir. You may step down, Mr. Aldaco. Watch your step as you go down those stairs.

THE WITNESS: Do I leave this?

THE COURT: Yeah, just leave the materials there,

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 15, 2012

Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

Proposed Changes to Jury Instructions

(Filed Nov. 16, 2012)

* * *

Willful Infringement

In this case, Halo argues that Pulse willfully infringed Halo's patents. To prove willful infringement, Halo must first persuade you that Pulse infringed a valid claim of Halo's patent. The requirements for proving Pulse infringed were discussed in my prior instructions.

In addition, Halo must prove willful infringement by clear and convincing evidence. This means Halo must persuade you that it is highly probable that prior to the filing date of the complaint, Pulse acted with reckless disregard of the claims of Halo's patents.

To demonstrate such "reckless disregard," Halo must persuade you that Pulse actually knew, or it was so obvious that Pulse should have known, that Pulse's actions constituted infringement of a valid patent.

In deciding whether Pulse acted with reckless disregard for Halo's patents, you should consider all of the facts surrounding the alleged infringement including, but not limited to, whether Pulse acted in a

manner consistent with the standards of commerce for its industry.

You should base your decision on the issue of willful infringement on all of the evidence, regardless of which party presented it.

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC.,	CASE NO: 2:07-CV-331-PMP-PAL
Plaintiff,	CIVIL
vs.	Las Vegas, Nevada
PULSE ELECTRONICS, INC., ET AL.,	Wednesday, Friday 16, 2012
Defendants.	(8:50 a.m. to 11:54 p.m.) (1:11 p.m. to 4:40 p.m.)

JURY TRIAL – DAY 8

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES: See page 2

Law Clerks: Kara Rickey/Cristen Thayer

Court Recorder: Henry Enriquez

Courtroom Administrator: Donna Sherwood

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[4] Las Vegas, Nevada; Friday, November 16, 2012; 8:50 a.m.

Call to Order

(Jury Present)

THE CLERK: All rise.

THE COURT: All right, have a seat everybody. All members of the jury and Counsel and parties are present and we will proceed with further examination of Ms. Munson.

Come on back up, Ms. Munson, if you would and

Mr. Melsheimer has some questions for you on Cross Examination.

(Pause)

MR. MELSHEIMER: May it please the Court, good morning, your Honor.

THE COURT: All right, good morning. Go ahead.

CARRIE MUNSON, DEFENDANTS' WITNESS, PREVIOUS SWORN

CROSS EXAMINATION

BY MR. MELSHEIMER:

Q Good morning, ma'am, how are you?

A Good morning, Mr. Melsheimer, I'm good.

Q This isn't the first time you've acted as a – as the face of Pulse, isn't that right?

A I was – are you talking about in the Halo litigation?

Q Yes, ma'am.

A I was deposed as a witness in 2009 and then I was deposed in 2010 as a 30-B6?

Q And you know what that is, right?

[5] A It means I'm a –

THE COURT: Just so the jury understands, a 30-B6 witness is someone that a corporate party will designate as a person most knowledgeable in a company on particular subjects, and so one side will ask to take a deposition of the person most knowledgeable at the other company on the subject of Human Resources, for example, whatever the subject may be, so that's just a rule of Civil Procedure that's being referred to.

MR. MELSHEIMER: Thank you, your Honor.

BY MR. MELSHEIMER:

Q You were designated to testify for certain topics on behalf of the company, right?

A That's correct.

Q One of the topics you were designated about was Pulse's response to the 2002 letters from the Halo Company, fair?

A Yes, that's correct.

Q You talked to several people within the company to get knowledgeable about the company's response back in 2002, right?

A Yes, I did.

Q One of the people you talked to was a gentleman, Victor Aldaco whom we heard from earlier?

A Yes, I talked to Victor Aldaco.

Q You knew that he was – that he was an engineer or a senior engineer in the company, right?

A That's correct.

[6] You knew that his ultimate boss was this gentleman, Kowalski, right?

A The ultimate – yes, John Kowalski was the President, that's correct.

Q And so there's been a couple of questions about do you know if Mr. Kowalski received that letter and I just want to kind of want to get rid of that question because we know he did because he went down to talk to Victor Aldaco about it, right?

A That's correct, he went to talk to Victor Aldaco about the second letter is my understanding.

THE COURT: Ms. Munson, could you keep your voice up or maybe move that microphone right in front of you and speak right into it and just project a little bit so that everybody can hear you.

THE WITNESS: Is this better?

THE COURT: I think so. Donna, that's turned on isn't it? Have you got your system switched?

THE CLERK: It's on.

THE COURT: It's on, okay, good. Thanks.

BY MR. MELSHEIMER:

So there's no doubt that Mr. Kowalski received that letter because that's why he strolled down to Mr. Aldaco's office and said, "Victor, I need you to take a look at this.", right?

A Well, I believe that's what Victor testified to, yes.

Q Now Mr. Aldaco did some work on that in response to the [7] request from Mr. Kowalski, right?

A Yes, he did.

Q He didn't do very much work, though, did he, ma'am?

A I think he said he spent about an hour or two.

Q Well, you described it, on behalf of Pulse, as cursory, right?

A Well, I actually described it as cursiorary, made up my own word apparently. But, yes, he did a – in my opinion he did a review – an initial review of the patent. It was, from what I understand, only a few pages in relation to some patents he would use it could be many, many pages and the terms in the patent were very familiar to him, and so it was very easy for him to read it, to look at all of the terms. He didn't need to go research what a gold wing pin was, he didn't need to research what an open header was so he was familiar with all of the terms and he was also familiar with parts that Pulse has done in the past had already met those requirements.

Q Ma'am, what was my question?

A Your question was – I don't remember, how long was he – how long did he review –

THE COURT: Well, go ahead, ask another one.

BY MR. MELSHEIMER:

Q Well, let me suggest – let me ask another question. Did you describe, under oath, Mr. Aldaco's review as cursory, isn't that right?

[8] A You can say that, I used the word "cursiory", yes.

Q And just so we're on the same page, I looked it up in the dictionary and somebody mentioned Wikipedia, I don't trust that as much I do the books, but –

A Okay.

Q "Cursory" is defined by Websters as "not thorough or hasty".

Does that square with your understanding of the word "cursory"?

A I would not have used "hasty" as a term. I would have – my impression was that he did an initial review. I used the word "cursory" My opinion was he did an initial review and that's what he testified to.

Q After this cursory review, as you described it, no one at Pulse, as far as you know, made a conscious decision that it was permissible to keep selling the infringing products, fair?

A I'm not aware of any specific decision that was made, no.

Q Now let's talk about issued patents, ma'am, okay? Are you with me?

A Yes.

Q All issued patents are available to the public, isn't that right?

A That is my understanding.

Q And one of the reasons that patents are available is we want innovators to disclose their inventions and their thought [9] processes about

those inventions to advance the progress of technology, is that a fair statement?

A Yes.

Q We saw that in the video. I know it seems a while ago, but we saw that video at the very beginning where it's a way of advancing the arts, as they say, and art, in a broad sense, meaning all the kinds of ways that people can improve on different sorts of technology, right?

A Yes.

Q Now it turns out that Halo's patents were publicly available just like any other patent would be after it was filed and issued by the Patent Office, right?

A That's correct.

Q And it turns out that Pulse's own patents actually cite to the Halo technology as prior art.

Were you aware of that, ma'am?

A Until yesterday, no, I was not.

Q Well, let's take a look at Exhibit 151 –

(Pause)

MR. MELSHEIMER: May I approach, your Honor?

THE COURT: You may.

BY MR. MELSHEIMER:

Q And we see here, in Exhibit 151, this is the Machado patent, I believe we talked about this with

one of the earlier Pulse witnesses, but we have this patent of Mr. Machado. Now, [10] he's a Pulse engineer, correct?

A Yes, he is.

Q The assignee is Pulse Engineering?

A Yes.

Q This was filed way back in 1998?

A I show May 1, 2001 as the date of patent.

Q Where – why don't you look where it says "5", where we have highlighted, ma'am? Do you see that?

A Oh, yes. Yes, September 30th, 1998.

Q Sometimes that is confusing, but just so we're on the same page, the date that the patent was issued is on the right-hand column, May 1st, but it actually was filed in September of '98. In fact, really, if you go right below that, Mr. Ang, it's pretty clear it was even filed earlier than that, at least a portion of it was filed back in November of 1997.

Do you see that, ma'am?

A I'm not familiar enough with patents to understand if that's what that means.

Q Fair enough. So let's look at the prior art that's cited. One of the prior art patents that Mr. Machado cites in the review of the technology that Pulse was doing before they filed this patent, is it in

fact the loop patent, which is the Halo patent, the 985 patent, which the jury has in their notebooks, right?

A Yes, I believe that's the case.

[11] Q Of course, this is one of the reasons why Pulse had to admit that it was aware of the 985 Halo patents as far back as 1998, right, ma'am?

A I don't know that.

Q Well, you know that Pulse has admitted to knowing about the Halo patents as far back as 1998, you know that, don't you?

A Yes, I do.

Q And you don't know if this is the reason why they know that, but at least you and I can agree that as of the filing date of this patent, at least Mr. Machado and perhaps some others at Pulse knew about the 985 patents, right?

A I don't know that.

Q Well, you know it's on there?

A I don't know that Russ Machado knew anything about the 985 patent.

Q You know it's on the patent disclosure, right?

A Yes, I do.

Q Thank you. And by "it", I mean the 985 patent?

A Yes, I do.

Q That's not the only Pulse patent that cites this prior art, the loop patent. Let's take a look at Exhibit 446.

MR. MELSHEIMER: Also, if it's not into evidence, your Honor, I'll offer it.

THE COURT: Donna, is that in, by chance?

THE CLERK: 44 – I don't have a 446.

[12] THE COURT: Okay.

MR. MELSHEIMER: 446 is the Morrison patent, your Honor. We offer it.

THE COURT: All right. Any objection to 446?

MR. HOLOHAN: No, your Honor.

THE COURT: Thank you. That will be received.

(Plaintiff's Exhibit Number 446 was received in evidence)

BY MR. MELSHEIMER:

Q So this was a patent that was filed in January of 2001?

A That's correct.

Q The inventors here are a man named Morrison and a man named Gutierrez that we're going to hear about – that we're going to hear from, I guess, today, right?

A Yes, that's correct.

Q And this patent, as of January 31st, 2001 when it was filed, also cites – it cites a different Halo patent, in this event the 785 patent, do you see that, ma'am?

A Yes, I do.

Q Ma'am, were you here when Mr. Hansen testified about his conclusion based all of the materials that he looked at, that about 30 percent of products that are sold by Pulse, manufactured outside the United States, end up coming back into the United States? Were you here for that testimony?

A Yes, I was.

Q You know that he looked at publicly available information [13] to come up with that number?

A That's what he explained, yes.

Q He looked at annual reports of Cisco, do you recall him talking about that?

A Yes, I do.

Q And Cisco and other customers of Pulse, right?

A Yes.

Q You heard him say that he thought that estimate was a conservative estimate, ma'am?

A That's what he said, yes.

Q And you're here and you've heard the testimony from people like Mr. Carpenter of Pulse who admit, certainly that more than zero percent of Pulse products find their way back into the United States, you heard him say that, right?

A Yes, I did.

Q You are not here on behalf of the company to offer a different number, right, ma'am?

A No, I'm not.

Q Ma'am, we talked about this at the very beginning, that you're here as Ms. Munson, but you're also here as kind of Pulse, right?

A That's correct.

Q In fact, in some of your answers you actually said – yesterday you actually said "Pulse believes" or "Pulse thinks", right?

[14] A That's correct.

Q So I want to talk about, then, some of the positions that Pulse has advocated in this case. Are you with me?

A Yes.

Q So Pulse has one defense in the case that "We're not infringing", right?

A Correct.

Q That's a defense?

A Correct.

Q Now, to be an infringer you only have to infringe one claim of one patent, you know that, right?

A That's my understanding.

Q Okay. Now you understand that infringement, patent infringement, is like trespassing, right?

A You could describe it that way, I guess.

Q All right. Now before you came to Court did you feel pretty strongly about Pulse's noninfringement position?

A Absolutely.

Q All right. But you know that Dr. Larson testified yesterday –

MR. MELSHEIMER: Can I get the ELMO, please, ma'am?

Q – you were here for Dr. Larson, weren't you, ma'am?

A Yes.

Q And Dr. Larson testified that he's not offering any sort of noninfringement defense or position on any of the claims [15] that are checked in red.

A Did you ask me a question?

Q You know that Dr. Larson testified that he's not offering any sort of noninfringement defense for

any of the claims that are checked in red, you heard him say that, right?

A I believe that's what he said, yes.

Q And, in fact, as to the claim that's checked in green, that's already been decided by the Court, hasn't it, ma'am?

A That's my understanding, yes.

Q So when you said yesterday that Pulse has a policy of not infringing patents, you remember you said that?

A Uh-huh?

Q Right? I'm sorry, she's got to pick that up. You've got to say "yes" or "no".

A Yes, that's what I said yesterday.

Q And – but, in fact, at least as to these claims from your own expert, they're not – he's not offering any noninfringement arguments as to anything that is checked in red, fair?

A That is fair.

Q Now even though you are confident that you're not trespassing on Halo's property, you were confident before you came to Court, you've got another defense, though, right, ma'am?

A That's correct.

[16] Q So you say "We're not on your property." It turns out you are, but your one defense is "We're not on your property", "We", Pulse," but even if we are your deed is no good."?

A That's exactly correct. You don't own the property.

Q Now – but, just to be clear, if the patents are valid, are you still confident in your noninfringement position?

A I don't believe the patents are valid.

Q If the jury finds the patents are valid, ma'am, are you still confident in your noninfringement position is my question?

A If the patents are found to be valid then we would be infringing on the areas that they checked.

Q Let's talk about the "your deed's no good" defense, okay? So were you here when your lawyer wrote up on the board "We developed the technology first."?

A Yes.

MR. MELSHEIMER: And, may I, your Honor?

THE COURT: Sure.

(Pause)

BY MR. MELSHEIMER:

Q Did you see that, ma'am?

A Yes.

Q Do I have it right, "We developed the technology first."?

A Did you have to write it?

Q Do I have that correct, that that's what it said?

* * *

[256] Q [William Woodford] Right. Now it wasn't until 1977 that we're starting to see the first drawings from the accused Pulse parts. So all I'm saying is that there is a five-year gap there where you had knowledge of all of these old parts of Western Electric and Rockwell, but it took until 1997 before you had the accused parts, right?

A [Aurelio Gutierrez] Yes, I don't understand what the Rockwell and Western Electric – those are not surface-mounting components.

Q So you don't understand why that would be relevant to the accused parts.

A I don't see why they are relevant. They are two-hole components versus surface-mounting components. That can be a difference.

Q Okay.

MR. WOODFORD: I have no further questions.

THE COURT: Thank you. Mr. Reed, any further examination?

MR. REED: Very briefly, your Honor.

REDIRECT EXAMINATION

BY MR. REED:

Mr. Gutierrez, in your over 40 years working on and designing Pulse products, including many of the products that are accused of infringement in this case, did you ever copy a Halo part?

A No.

[257] Q In your over 40 years of working and designing Pulse products, are you aware of any instance where anyone at Pulse ever copied a Halo part?

A No, I wasn't even aware of existence of Halo, no. Never seen any product.

MR. REED: No further questions, your Honor.

THE COURT: Thank you. And anything further of the witness, Mr. Woodford?

MR. WOODFORD: Nothing further, your Honor.

THE COURT: All right, thank you, Mr. Gutierrez, you can be excused. Watch your step as you go down. You can just leave the exhibits there.

(Witness excused)

Ladies and gentlemen, we'll go ahead and break at this time for the weekend. I appreciate your patience, and let me tell you, I've consulted with counsel and it appears that we will finish the presentation of all the evidence on Monday. Actually, as I have reflected on it, counsel have been within the estimates that they had made. They told me eight days, and I think that's what I told you when you were selected. But I forgot to factor in that Tuesday was election day, we were breaking early, it was also jury selection. So we'll get in under the wire in eight days of actual evidentiary presentation. And then I anticipate the closing arguments will be on Tuesday morning for you, and you will then retire to

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hudson — November 17, 2012
Signed — Dated

TONI HUDSON, TRANSCRIBER

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

DRAFT COPY

HALO ELECTRONICS, INC.,	CASE NO: 2:07-CV-331-PMP-PAL
Plaintiff,	CIVIL
vs.	Las Vegas, Nevada
PULSE ELECTRONICS, INC., ET AL.,	Monday, Friday 19, 2012
Defendants.	(8:27 a.m. to 12:22 p.m.) (1:18 p.m. to 4:43 p.m.)

JURY TRIAL – DAY 9

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES: See page 2

Law Clerks: Kara Rickey/Cristen Thayer

Court Recorder: Henry Enriquez

Courtroom Administrator: Donna Sherwood

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Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[252] [Wilmer Bottoms] . . . entire industry looking for a solution to a problem they knew that the entire industry having available the references, at least the ones that were before the Patent Office in the re-exam, that they didn't come up with this solution. If it were obvious, they would have.

Q [Tom Melsheimer] Is Mr. Gutierrez's testimony that you talked about earlier, is that also, now that we've talked through some of these issues, might you put this in even more focus?

A Well, I think it comes to the same thing. He says, to just read his answers, "Yes, I don't understand what the Rockwell and Western Electric. These are not surface mounted components. I don't see why they are relevant." And that was in response to an answer of so you don't – on the question, "So you don't understand why that would be relevant to the accused parts." So as I think I said before, here's someone that probably knows as much about it as anyone. He certainly knows what's out in the prior art, both the ones they talked about as Dr. Larson's references and all the rest of them, and yet it wasn't obvious to him that it had any relevance to the accused part. So we have at least one very expert person who was there at the time, and even at the time that this testimony was given it wasn't obvious to him.

Q Now, putting aside everything you've told us so far, is there another important reason why you believe that Pulse has not established that the patents are obvious?

[255] Q Did you consider these secondary considerations of non-obviousness?

A Yes, I did.

Q Let's go through them quickly. We're not going to go through each one of them. We've highlighted one, two, four and six. And if you could, tell the jury why each of those demonstrates that the Halo patents are not obvious and therefore not invalid –

A Well –

Q – and give us an example of the evidence you've heard of each one. Can you do that?

A I hope so.

Q All right.

A The invention's commercial success, well, we've heard testimony here that Halo went from a threat of no revenue and had a very rapid revenue growth for a period of time after we got through the period of skepticism, percentage-wise an enormous growth rate. That's clear evidence of a commercial success. If I look at Pulse's information, once they began to ship accused parts, they shipped $257,000,000 worth of accused parts, according to the testimony we heard in the trial. That's clearly evidence of a commercial success.

Q Why is it, Doctor, that something being successful is a consideration that the jury should look at for why that would make it non-obvious?

[256] A Well, it makes it novel. If it weren't novel, why would it be successful? There were already other choices that gave them the same value. There were no such choices that gave them the sale value so it's non-obvious.

Q Let's look at Secondary Consideration of Non-Obvious Number Two. What is that?

A Long felt but unresolved needs.

Q What evidence did you find of that?

A Well, there was a lot of evidence presented in the testimony of the Pulse witnesses about this but we've heard several times during this trial that people knew about this problem for years. Sometime in the 1980s, we knew about the problem. The whole industry knew about the problem. We know that people were working on it. We know that Halo was working on it. We know that people were trying different kinds of solutions. I would submit that all of the solutions, except the one proposed by Halo, failed. And therefore, it was a long felt need and for years it was not resolved.

Q What about this notion of skepticism by others? What does that say about whether something is obvious or not obvious?

A Well, maybe I just point to the testimony of Mr. Heaton, Jeff Heaton, about what HP did. So when they came up with this design and they wanted their customers to make tests on it to see if it would meet their requirements, one of their customers did. They

sent the same parts at about the same time to [257] Hewlett Packard. As far as they are able to determine, Hewlett Packard never even evaluated the parts because they were different. And we heard other people, Mr. Diggins talked about the fact that the customers complained that they just – you know, they looked different. So we've heard testimony from several people that people considered that there was – that condition wasn't satisfied.

Q So in this notion of skepticism, is this like if you show someone something and it's obvious, they'll say, oh, of course. That's a great solution. Versus if you show someone something and they say, I'm not so sure about that. I don't think that's going to work. Is one of those an indication of it being obvious and one of those an indication of it being not obvious?

A Yes, I guess I heard someone – I forgot whose testimony it was but someone said that, well, that'll never work. It doesn't have anything on the bottom to protect it. And that's the first reaction you get. This is not the only part type that has that problem. And I can tell you that skepticism occurred for other things like Mimm's devices where they didn't have that protection.

Q Finally, "Teaching a Way by Others," what does that tell us about these patents being non-opvious?

A Well, if you look at the work that other people were doing, the solutions that they were pursuing – and there's quite a lot of evidence of that; it's present

in the testimony [258] we've heard. It's also present in the patents that were filed by the parties in this case, that they were working on other things. In fact, in Pulse's case the patents filed indicate that they were spending more of their time working on an interlocking part. They were spending time working on various ways to remove the requirement to wrap the wires around a terminal post. We have spent a lot of time talking about that but they were working on different things as opposed to the solution that ultimately was determined.

Q So the fact that Pulse was working in a different direction, what does that tell us about whether or not these patents are obvious?

A Well, if they thought this direction was obvious, this is the direction they would be working in.

Q We're not going to go through the others but did you consider those as well, sir, in your analysis?

A Yes, I did.

Q All right. Now, Pulse has offered another invalidity defense besides the ones we've talked about so far, correct?

A Yes, they have.

Q Does that involve the notion that this Mr. T.K Luk is the real inventor?

A Yes, they claim that the inventor was Mr. T.K. Luk rather than the Halo group that had worked on it for months.

Q Now, putting aside the evidence that the jury has in front

* * *

[271] [Tom Melsheimer] issue or the epoxy issue, how many claims of the patents does Pulse still infringe?

A [Wilmer Bottoms] Well we'd have to go back and look at it. I haven't been actually counting them up but most of them.

Q More than half, do you think, sir?

A Yes, well more than half.

Q All right.

A The only three groups that are affected in any significant way.

Q Finally, Dr. Bottoms, I want to end with the timeline that you helped us create.

MR. MELSHEIMER: Do we have that, Mr. Ang? I have it actually.

Q What is illustrated in this timeline and why is it important to your conclusion that the Halo patents are not obvious?

A Well, it's some evidence of the work that Pulse was doing during this period of time. Obviously, I don't have all evidence of what they were doing but

it starts off with Western Electric and two whole parts, 1975 through sometime in 1980. 1986 Rockwell part was introduced. It shipped for about three years, about 700,000 parts if I remember correctly. Then in 1991, we see the length – Gutierrez patent criticizing designs with wires wrapped on them and soldering on terminal pins. And they explained that that was part of the problem they were [272] trying to solve. In 1994, Pulse switched their 65967 part from a silicone to epoxy. Now, I don't know exactly why they made that change but the only thing I can surmise is that it was done to give the part more strength. Somehow more strength is competing against the forces that cause it to fail.

Q What is happening in 1996 and 1997 while the Halo patents are in the patent office?

A Well, they continued to promote their transfer molded parts heavily and they're introducing new versions of it which are the interlock part.

Q And as far as 2001, is Pulse going – with its ideas and designs is it at that point going towards the Halo design or is it suggesting a totally different direction?

A There's nothing that suggests that doing any work toward the Halo designs until after the Halo product had been sold for some period of time and began to take market share.

Q In light of all this, does it make any sense to make the argument that the Halo patent claims are obvious?

A It certainly makes no sense to me.

MR. MELSHEIMER: I tender the witness for cross-examination, your Honor.

THE COURT: All right. Ladies and gentlemen, we're going to take a break for 10 minutes before we have cross-examination. Do you have that little – Donna, would you gather that and hang on to that, please. We'll take a 10-

* * *

[301] [David Sipiora] among the elements of the Halo invention?

A [Wilmer Bottoms] I think that the other elements had some implementation of some sort in each case, not necessarily the same. And it's not just the sum of the elements; it's how they're combined to form a solution.

Q Well, isn't it the case that we've heard testimony repeatedly that all of the elements were known and available in the art and your position is just the way that they're combined that makes them special, right?

A You've heard testimony from someone, but you haven't heard it from me. I've already told you that there were two that were not known and common in the art.

Q Okay. Now let's talk about predictable results, the idea of opening the bottom. It was a predictable result by taking the bottom off on this

design, this two-piece design, that the (indiscernible) (3:59:45) would have a place to go, correct?

A That's correct.

Q That wasn't a big surprise?

A I don't think so.

Q In fact it was predictable?

A I think it was an expected result.

Q Okay. So known methods and predictable results and you're disagreeing with me on a couple of things that you think maybe weren't familiar, but we haven't really got down to the bottom (4:00:04) other than maybe pins and maybe standoffs in surface [302] mounts, is that right? Is that fair?

A I think that's fair.

Q Okay. So let's – I'd like to move over to Dr. Larsen's analysis, which you've talked about a bit, and you know that he looked at four different references in particular in the context of his analysis, right?

A I do.

Q I think he looked at Valor, Western Electric, Rockwell, and Akachi, right?

A That's correct.

Q Okay. So let's start with Valor. You've already agreed that notched posts were well known in the art in August 1995, correct?

A Yes.

Q Okay. And in fact, we've seen –

MR. SIPIORA: If we can pull up Demonstrative 2-A.

We've seen this before. If we could pull up the Valor drawing on the left and the Halo drawing on the right.

BY MR. SIPIORA:

Q So you've seen these before, right?

A Yes, I have.

Q All right. You know that in connection with the analysis of invalidity with respect to a number of the claims the only element missing from a combination with Rockwell is the notched post, correct?

[303] A Yes, there are some of the claims that have notched posts missing.

Q Yes, so if you have a notched post with Rockwell you have invalidity with several of the claims (4:01:24)?

A With some of the claims, yes.

Q Okay. So a notched post in Rockwell (indiscernible) Rockwell and the notched post is the only thing (indiscernible) these claims. So let's look at a notched post.

A notched post was known to Valor in 1989. You've seen this repeatedly, this drawing, correct, it's on your screen?

A Yes.

Q And we know that Halo had a notched post in 1992, correct?

A I believe '92 is the appropriate date.

Q And you would agree with me that these drawings are identical, would you not?

A They appear to be.

MR. SIPIORA: Okay. So let's go to the next slide. All right. Okay.

So what I'd like to do is I'd like to go – if you could take that down. Let's go to 539.

BY MR. SIPIORA:

Q Are you familiar with this drawing?

A I don't see a drawing yet.

Q Oh, well, maybe another minute.

[304] A Yes, it's up now.

Q Okay. You've heard – are you familiar with this drawing?

A Yes, I've seen that drawing before.

Q Okay. And you've heard testimony that this was a drawing that came, was faxed from T.K. Luk to Jim Heaton on June 22nd, 1994, correct?

A There was more than one version of this drawing and I've certainly heard testimony that it has been faxed back and forth. I can't actually read the dates on here and I don't remember the dates of each time it went back and forth, but if you say it's so, it's okay.

Q All right. So – and we know that in this case that Halo has said this is the first evidence that they have of the conception of their entire invention, correct?

A I'm not sure I would characterize it that way, because we have their testimony, which I believe is evidence.

Q Well, no, they say that the first document, a document that shows their conception –

A If you're restricting it to a document, yes –

Q Okay.

A – I believe that's the only one they have.

Q Okay, it's the only one they have, so let's be clear for the jury here, this document, 539, is the document that Halo has pointed to as evidence of its conception of the invention that's at issue in this case, the invention's all here

* * *

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

Jury Instructions

(Filed Nov. 20, 2012)

* * *

Willful Infringement

In this case, Halo argues that Pulse willfully infringed Halo's patents.

To prove willful infringement, Halo must first persuade you that Pulse infringed a valid claim of Halo's patent. The requirements for proving Pulse infringed were discussed in my prior instructions.

In addition, Halo must prove willful infringement by clear and convincing evidence. This means Halo must persuade you that it is highly probable that prior to the filing date of the complaint, Pulse acted with reckless disregard of the claims of Halo's patents.

To demonstrate such "reckless disregard," Halo must persuade you that Pulse actually knew, or it was so obvious that Pulse should have known, that Pulse's actions constituted infringement of a valid patent.

In deciding whether Pulse acted with reckless disregard for Halo's patents, you should consider all of the facts surrounding the alleged infringement including, but not limited to, whether Pulse acted in a

manner consistent with the standards of commerce for its industry.

You should base your decision on the issue of willful infringement on all of the evidence, regardless of which party presented it.

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA
LAS VEGAS DIVISION

HALO ELECTRONICS, INC.,	CASE NO: 2:07-CV-331-PMP-PAL
Plaintiff,	CIVIL
vs.	Las Vegas, Nevada
PULSE ELECTRONICS, INC., ET AL.,	Tuesday, Friday 20, 2012
Defendants.	(8:28 a.m. to 12:16 p.m.) (12:46 p.m. to 6:34 p.m.)

JURY TRIAL – DAY 10

BEFORE THE HONORABLE PHILIP M. PRO,
UNITED STATES DISTRICT JUDGE

APPEARANCES:	See page 2
Law Clerks:	Kara Rickey/Cristen Thayer
Court Recorder:	Henry Enriquez
Courtroom Administrator:	Donna Sherwood
Transcribed by:	Exceptional Reporting Services, Inc. P.O. Box 18668 Corpus Christi, TX 78480-8668 361 949-2988

Proceedings recorded by electronic sound recording; transcript produced by transcription service.

[172] [The Court] . cannot be liable for infringement.

"In this case Halo argues that Pulse willfully infringed Halo's patents. To prove willful infringement, Halo must first persuade you that Pulse infringed a valid claim of Halo's patent. The requirement for proving Pulse's – I'm sorry. The requirements for proving Pulse infringed were discussed in my prior instructions. In addition, Halo must prove willful infringement by clear and convincing evidence. This means Halo must persuade you that it is highly probable that prior to the filing date of the complaint, Pulse acted with reckless disregard of the claims of Halo's patents. To demonstrate such reckless disregard, Halo must persuade you that Pulse actually knew or it was so obvious that Pulse should have known, that Pulse's actions constituted infringement of a valid patent. In deciding whether Pulse acted with reckless disregard for Halo's patents, you should consider all of the facts surrounding the alleged infringement including, but not limited to, whether Pulse acted in a manner consistent with the standard of commerce for its industry. You should base your decision on the issue of willful infringement on all of the evidence, regardless of which party presented it.

* * *

CERTIFICATION

I certify that the foregoing is a correct transcript from the electronic sound recording of the proceedings in the above-entitled matter.

/s/ Toni Hunger [SEAL]

HUDSON, TRANSCRIBER

November 21, 2012

UNITED STATES DISTRICT COURT

DISTRICT OF NEVADA

* * *

HALO ELECTRONICS, INC., Plaintiff, v. PULSE ELECTRONICS, INC. and PULSE ELECTRONICS CORPORATION, Defendants.	2:07-cv-00331-PMP-PAL **VERDICT** (Filed Nov. 20, 2012)

We, the jury in the above-entitled case, find the following special verdict on the questions submitted to us:

FINDINGS ON INFRINGEMENT

I. Direct Infringement

A. U.S. Patent No. 5,656,985 ("the '985 patent")

QUESTION 1: Has Halo proven that it is more likely than not that each of the following Pulse products has directly infringed any of the following claims of the '985 patent?

a. *Pulse H0022 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H1260 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1305 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1174 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H0026 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0019 Product:*

Claim 6: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 7: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 8: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 16: YES (finding for Halo) ____
NO (finding for Pulse) NO

g. *Pulse 23Z110SMNL Product:*

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

B. U.S. Patent No. 6,297,720 ("the '720 patent")

QUESTION 2: Has Halo proven that it is more likely than not that each of the following Pulse products has directly infringed any of the following claims of the '720 patent?

a. *Pulse H0022 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H0009 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1260 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1305 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H1174 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0026 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

g. *Pulse H0019 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) [redacted]
NO (finding for Pulse) NO

h. *Pulse 23Z110SMNL Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

C. U.S. Patent No. 6,344,785 ("the '785 patent")

QUESTION 3: Has Halo proven that it is more likely than not that each of the following Pulse products has directly infringed any of the following claims of the '785 patent?

a. *Pulse H0022 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H0009 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1260 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1305 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H1174 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0026 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

g. *Pulse H0019 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

II. Induced Infringement

A. The '985 Patent

QUESTION 4: With respect to the following Pulse products, has Halo proven that it is more likely than not that Pulse induced others to infringe the '985 Patent?

IF YOUR ANSWER TO QUESTION 1 WAS "NO" FOR ANY PULSE PRODUCT WITH RESPECT TO ANY CLAIM OF THE '985 PATENT, THEN YOUR ANSWER TO THIS QUESTION 4 MUST ALSO BE "NO" FOR THAT SAME PRODUCT AND THAT SAME CLAIM.

a. *Pulse H0022 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H1260 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1305 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1174 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H0026 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 7: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0019 Product:*

Claim 6: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 7: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 8: YES (finding for Halo) ____
NO (finding for Pulse) NO

Claim 16: YES (finding for Halo) ____
NO (finding for Pulse) NO

g. *Pulse 23Z110SMNL Product:*

Claim 8: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 16: YES (finding for Halo) YES
NO (finding for Pulse) ____

B. The '720 Patent

QUESTION 5: With respect to the following Pulse products, has Halo proven that it is

more likely than not that Pulse induced others to infringe the '720 patent?

YOU MUST ANSWER QUESTION 5(a) WITH RESPECT TO CLAIM 1. FOR ALL OTHER CLAIMS, IF YOUR ANSWER TO QUESTION 2 WAS "NO" FOR ANY PULSE PRODUCT WITH RESPECT TO ANY CLAIM OF THE '720 PATENT, THEN YOUR ANSWER TO THIS QUESTION 5 MUST ALSO BE "NO" FOR THAT SAME PRODUCT AND THAT SAME CLAIM.

a. *Pulse H0022 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H0009 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1260 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1305 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H1174 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0026 Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

g. *Pulse H0019 Product:*

Claim 1: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 6: YES (finding for Halo) ____
NO (finding for Pulse) NO

h. *Pulse 23Z110SMNL Product:*

Claim 6: YES (finding for Halo) YES
NO (finding for Pulse) ____

C. The '785 Patent

QUESTION 6: With respect to the following Pulse products, has Halo proven that it is more likely than not that Pulse induced others to infringe the '785 patent?

IF YOUR ANSWER TO QUESTION 3 WAS "NO" FOR ANY PULSE PRODUCT WITH RESPECT TO ANY CLAIM OF THE '785 PATENT, THEN YOUR ANSWER TO

THIS QUESTION 6 MUST ALSO BE "NO" FOR THAT SAME PRODUCT AND THAT SAME CLAIM.

a. *Pulse H0022 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

b. *Pulse H0009 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

c. *Pulse H1260 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

d. *Pulse H1305 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

e. *Pulse H1174 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

f. *Pulse H0026 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

g. *Pulse H0019 Product:*

Claim 40: YES (finding for Halo) YES
NO (finding for Pulse) ____

Claim 48: YES (finding for Halo) YES
NO (finding for Pulse) ____

IV. Willful Infringement

QUESTION 7: Has Halo proven that it is highly probable that Pulse's infringement was willful?

YES (finding for Halo) YES
NO (finding for Pulse) ____

FINDINGS ON PULSE'S INVALIDITY DEFENSES

I. Obviousness

QUESTION 8: Has Pulse proven that it is highly probable that the following claims of the '985 patent are invalid because they were obvious to one of ordinary skill in the field at the time of the invention?

Claim 6: YES (finding for Pulse) ____
NO (finding for Halo) NO

Claim 7: YES (finding for Pulse) ____
NO (finding for Halo) NO

Claim 8: YES (finding for Pulse) ____
NO (finding for Halo) NO

Claim 16: YES (finding for Pulse) ____
NO (finding for Halo) NO

QUESTION 9: Has Pulse proven that it is highly probable that the following claims of the '720 patent are invalid because they were obvious to one of ordinary skill in the field at the time of the invention?

Claim 1: YES (finding for Pulse) ____
NO (finding for Halo) NO

Claim 6: YES (finding for Pulse) ____
NO (finding for Halo) NO

QUESTION 10: Has Pulse proven that it is highly probable that the following claims of the '785 patent are invalid because they were obvious to one of ordinary skill in the field at the time of the invention?

Claim 40: YES (finding for Pulse) ____
NO (finding for Halo) NO

Claim 48: YES (finding for Pulse) ____
NO (finding for Halo) NO

II. Inventorship

QUESTION 11: Has Pulse proven that it is highly probable that the '985 patent is invalid because it failed to name all actual inventors?

YES (finding for Pulse) ____
NO (finding for Halo) NO

QUESTION 12: Has Pulse proven that it is highly probable that the '720 patent is invalid because it failed to name all actual inventors?

YES (finding for Pulse) ____
NO (finding for Halo) NO

QUESTION 13: Has Pulse proven that it is highly probable that the '785 patent is invalid because it failed to name all actual inventors?

YES (finding for Pulse) ____
NO (finding for Halo) NO

FINDINGS ON DAMAGES (if applicable)

I. Damages Period

IF YOU HAVE ANSWERED "YES" FOR ALL CLAIMS IN QUESTIONS 8-10, AND/OR "YES" FOR ALL PATENTS IN QUESTIONS 11-13, THEN DO NOT ANSWER THE REMAINING QUESTIONS AND PROCEED TO THE END OF THIS PAGE 11 TO DATE AND SIGN THIS VERDICT FORM.

QUESTION 14: Has Halo proven that it is more likely than not that it marked substantially all of the products it made, offered for sale, or sold under each of its patents, and

that Halo made reasonable efforts to ensure that its licensees who made, offered for sale, or sold products under each of its patents marked the products on some date before March 15, 2007?

YES (finding for Halo) YES
NO (finding for Pulse) ____

If YES, on what date? July 1st, 2003

II. Royalty Rate

QUESTION 15: What royalty rate has Halo shown that more likely than not would be adequate to compensate Halo for Pulse's infringement?

Royalty Rate: 4.5 %

III. Total Amount of Damages

QUESTION 16: What total amount of damages has Halo shown more likely than not would be adequate to compensate Halo for Pulse's infringement?

Amount of Damages: $1,500,000.00

Date and sign this verdict form.

DATED: 11/26/12

_____

No. 14-1513

DEC - 9 2015
OFFICE OF THE CLERK

In The Supreme Court of the United States

HALO ELECTRONICS, INC.,

Petitioner,

v.

PULSE ELECTRONICS, INC.,
PULSE ELECTRONICS CORPORATION,

Respondents.

On Writ Of Certiorari To The United States Court Of Appeals For The Federal Circuit

JOINT APPENDIX
VOLUME II
EXHIBITS

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mark.hogge@dentons.com

[Additional Counsel Listed On Inside Cover]

Petition For Certiorari Filed June 22, 2015
Certiorari Granted October 19, 2015

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VOLUME II

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Plaintiff's Exhibit PTX-92, August 6, 2015 Letter from Halo to Pulse re Potential License to Halo Patents, admitted into evidence on November 7, 2012 197

Plaintiff's Exhibit PTX-123, Toolmaker Drawing of Halo's Surface Mount Transformer, admitted into evidence on November 13, 2012 199

Defendants' Exhibit DTX-512, Drawing of Pulse's Surface Mount Technology from 1991, admitted into evidence on November 14, 2012 201

Defendants' Exhibit DTX-526, Drawing of Pulse Part PE-64309 from 1986, admitted into evidence on November 14, 2012 202

Defendants' Exhibit DTX-533 (A7955-56.4), Excerpt from "Electronic Packaging and Interconnection Handbook" 206

Defendants' Exhibit DTX-539, Toolmaker Drawing of Halo's Surface Mount Transformer, admitted into evidence on November 13, 2012 211

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Defendants' Exhibit DTX-580, Drawing of Pulse Part PE060589 from 1980, admitted into evidence on November 14, 2012.....226

Defendants' Exhibit DTX-605 (A8622-23.5), Excerpt from "Handbook of Surface Mount Technology", admitted into evidence on November 15, 2012 236

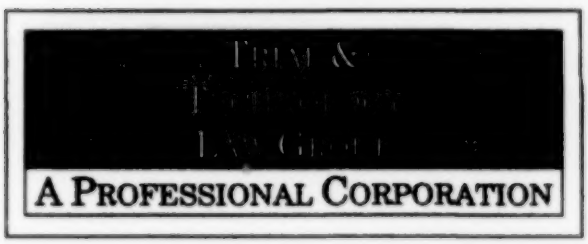
Defendants' Exhibit DTX-626, Japanese Unexamined Utility Model Application Publication H5-55513, admitted into evidence on November 15, 2012 241

Defendants' Exhibit DTX-644, Drawing of Pulse Part PE-65793, admitted into evidence on November 14, 2012 256

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

(Admitted Into Evidence On 11/7/12)

Plaintiff's Trial Exhibit
PTX 91
2:07-cv-00331-PMP



545 MIDDLEFIELD ROAD
SUITE 220
MENLO PARK, CALIFORNIA
94025

TELEPHONE: (650) 324-2223
FACSIMILE: (650) 324-0178
URL: WWW.TECHTRIALLAW.COM
E-MAIL: INFO@TECHTRIALLAW.COM

Robert A. Spanner
Direct Dial Number: (650) 324-2277
E-mail: ras@techtriallaw.com

July 9, 2002

John Kowalski, President
Pulse Engineering
12220 World Trade Drive
San Diego, CA 92128

Re: **Halo Electronics, Inc.**

Dear Mr. Kowalski:

We are writing on behalf of Halo Electronics, Inc. ("Halo") to notify you of certain surface mount packaging patents the company has recently acquired. copies of which are enclosed for your reference.

Halo is interested in licensing these patents, and would like to solicit your company's interest in entering into negotiations for the license of these patented technologies.

We would appreciate knowing of your interest by the end of the month. Thank you for your attention to this matter.

Very truly yours,

/s/ Robert A. Spanner
Robert A. Spanner

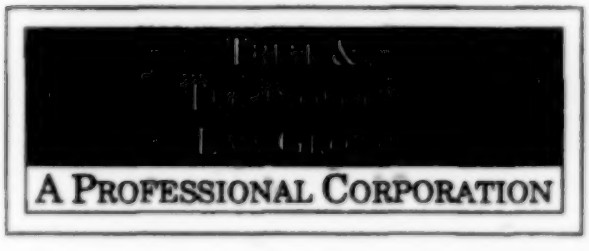
RAS:rs
2306251

Encl.

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

(Admitted Into Evidence On 11/7/12)

Plaintiff's Trial Exhibit
PTX 92
2:07-cv-00331-PMP



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MENLO PARK, CALIFORNIA
94025

TELEPHONE: (650) 324-2223
FACSIMILE: (650) 324-0178
URL: WWW.TECHTRIALLAW.COM
E-MAIL: INFO@TECHTRIALLAW.COM

Robert A. Spanner
Direct Dial Number: (650) 324-2277
E-mail: ras@techtriallaw.com

August 6, 2002

John Kowalski, President
Pulse Engineering
12220 World Trade Drive
San Diego, CA 92128

Re: **Halo Electronics, Inc.**

Dear Mr. Kowalski:

A month ago we wrote on behalf of Halo Electronics, Inc. ("Halo") to notify you of certain surface mount packaging patents the company has recently

acquired, and of its interest in licensing these patents.

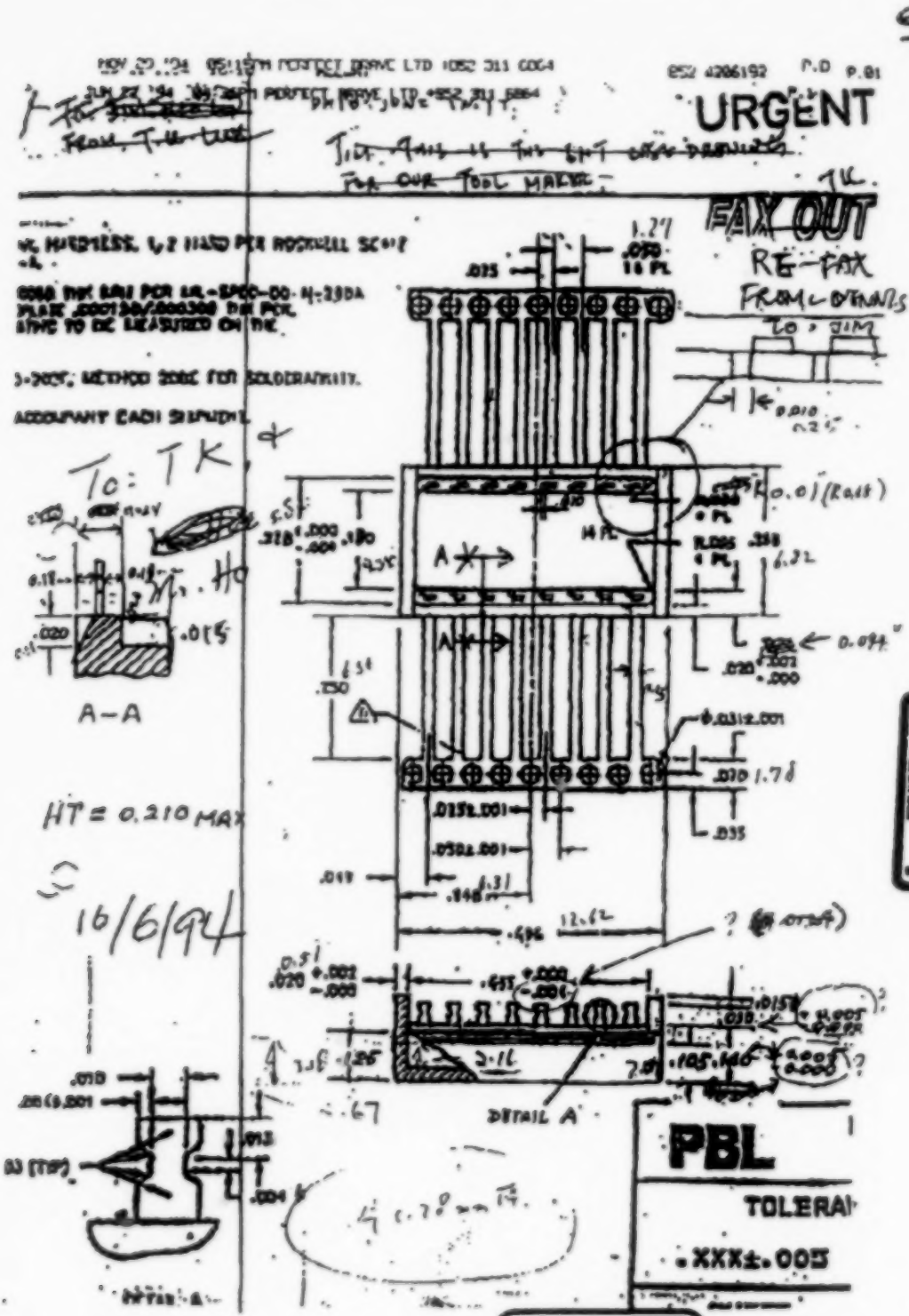
There is reason to believe that surface mount products manufactured by your Company which are not of transfer molded construction may possess features similar to those embodied in the patented devices described in Halo's patents previously provided to you. Halo has not yet reached any conclusive determinations as to whether your company's products are covered by its patents; rather, Halo is devoting its energy to working out suitable arrangements with companies that would benefit from licensing Halo's patented technologies. We believe that Pulse Engineering is one such firm.

Please advise us whether your company would be interested in entering into negotiations for the license of Halo's technologies described in Halo's patents previously provided.

Very truly yours,

/s/ Robert A. Spanner
Robert A. Spanner

RAS:rs
2306251



Plaintiff's Trial Exhibit
PTX 123
2:07-cv-00331-PMP

FROM: P. LU

JIM, THIS IS THE LAST ONE FOR OUR TOOL MAKER. TK

BAR HARDNESS, 4/2 HARD PER ROCKWELL SCALE B-4.

.000250 THK GRI PER MIL-SPEC-00-N-290A
COPLATE .000150/.000300 THK PER
PLATING TO BE MEASURED ON THE

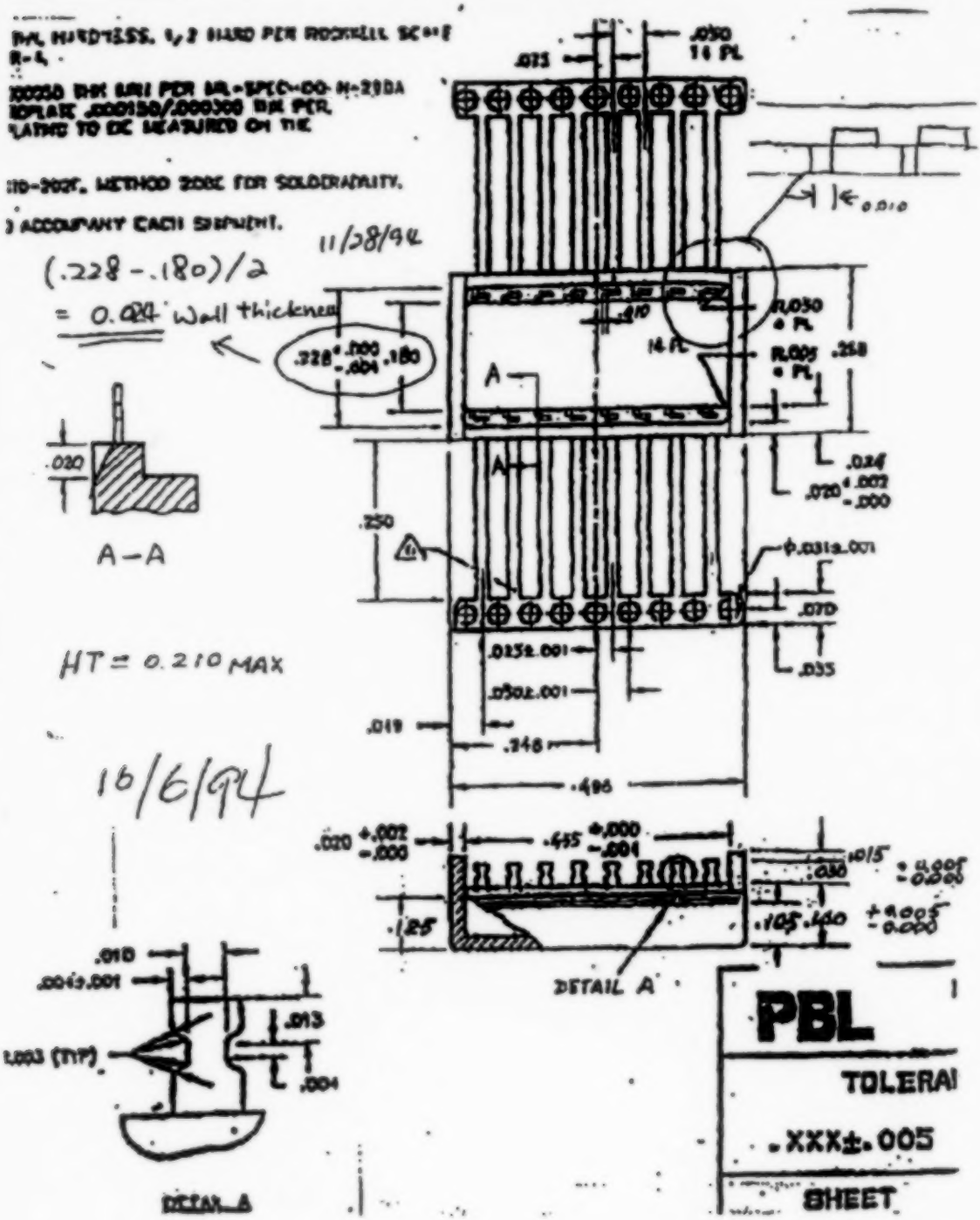
110-202F, METHOD 208C FOR SOLDERABILITY.

ACCOMPANY EACH SHIPMENT.

11/28/94

(.228 - .180)/2

= 0.024 Wall thickness



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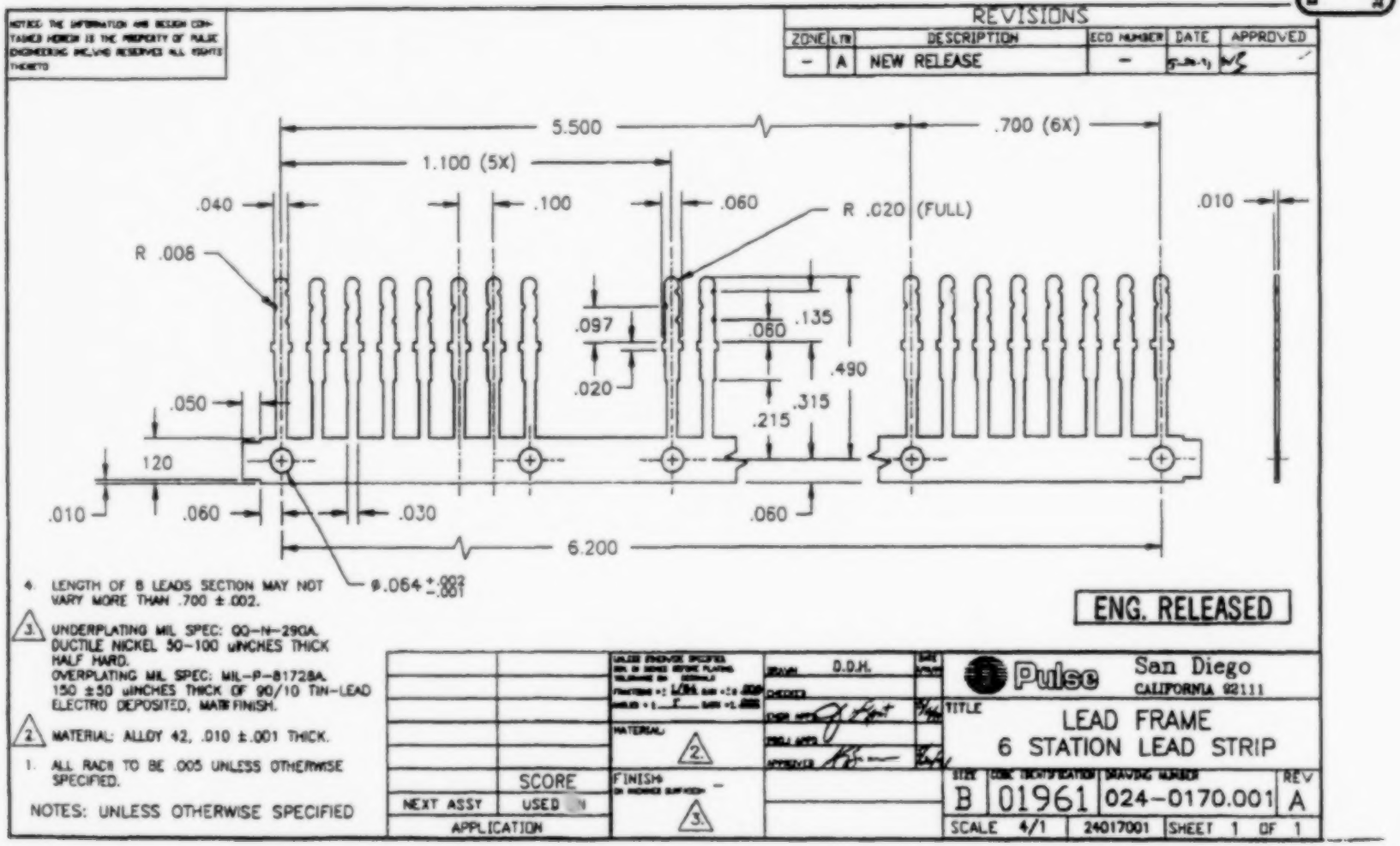
10/6/94

UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

(Admitted Into Evidence On 11/14/12)

DTX-512



UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

(Admitted Into Evidence On 11/14/12)

Defendants' Trial Exhibit

DTX-526

2:07-cv-00331-PMP-PAL

4 3 2 1

Pulse Engineering, Inc. **CUSTOMER** ROCKWELL **PE-** 64309
San Diego, California 92112 **JOB NUMBER** _____ **REV** N
8-31-88

LIST OF MATERIALS

ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION	SPECIFICATIONS OR NOTES
1	4	WCI-64309	WOUND COIL SUBASSEMBLY	
2	1	043-0961.001	HEADER:	24 PIN
3				
4				
5	A/R	082-0007.001	INK: MARKEM UV #9060	WHITE
6	A/R	083-0044.001	SOLDER: 40/60 BAR	
7	.0007#	081-0176.001	SYLGARD: 1-2577	
8	.00002#	081-0174.002	CATALYST: 176	DOW CORNING
9	.062	075-0044.001	SHIPPING TUBE:	
10	.124	075-0062.001	THUMB TACK:	MERITEX
11	A/R	083-0058.003	SOLDER: 40/60 0.028 DIA.	

TEST FIXTURES AND/OR PROCEDURES

JM-17880	FORMING & TRIMMING DIE.	ENG. RELEASED
P-20637	GENERAL MANUFACTURING PROCEDURE.	
P-21153	PROCEDURE. PACKAGING.	
P-21154	MANUFACTURING PROCEDURE	

NOTES: UNLESS OTHERWISE SPECIFIED –

1.0 IN THE EVENT OF CONFLICT BETWEEN THIS SPECIFICATION AND THE CUSTOMER SPECIFICATION, THE LATTER SHALL GOVERN.

2.0 INTERPRET THIS SPECIFICATION PER MIL-D-1000 AND STANDARDS REFERENCED THEREIN.

3.0 ALL TEST CONDITIONS PER MIL-STD-202, PARA 2.2, EXCEPT TEMPERATURE TO BE 25 ± 5° C.

THIS RELEASE
SUPERSEDES REV. _____
RETURN REVISION _____
TO PRODUCTION CONTROL

8

LTR	DESCRIPTION	ECO NO.	DATE	APPROVED
N	L/M QTY. ITEM 10	20920	3/31/88	LR/av
M	CHANGE PER ECN	20790	7/12/88	LR/av
L	CHANGE PER ECN	20454	02/16/00	LEON/av
K	CHANGE PER ECN	29977	9/4/87	FL/av
J	CHANGE PER ECN	29814	6/30/87	FL/av
H	CHANGE PER ECN	29746	6/10/87	LR/[illegible]
G	CHANGE PER ECN	29718	5/20/87	FL//a Mers
F	CHANGE PER ECN	29522	3/6/87	LR/BL
D	CHANGE PER ECN	29402	12/2/86	LR/BL
C	L/M ITEM-6 WAS 083-0011	29301	10/3/86	LR/av
B	CHANGE PER ECN	29230	8/23/86	LR/MM.
A	L/M ADDED ITEMS 9 & 10	29145	7/21/86	LR/MM.

	REV STATUS	REVISION	N	F	M																						
	OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		

NOTICE: THE INFORMATION AND DESIGN CONTAINED HEREIN IS THE PROPERTY OF PULSE ENGINEERING, INC. AND RESERVES ALL RIGHTS THERETO.	UNLESS OTHERWISE SPECIFIED, DIMENSIONS IN INCHES BEFORE PLATING. TOLERANCES ON: FRACTIONS = ± _____ – ANGLES = ± _____ – DECIMALS: 0.XX = ± .010 0.XXX = ± .005	[ILLEGIBLE]	DATE 6/10/86	**Pulse Engineering, Inc.** San Diego, California 92112	
		CHECKED		TITLE SURFACE MOUNT PULSE TRANSFORMER	A
		ENGRG APPS [Illegible]	6/19/86		
		PROS APPS			
		APPROVED [Illegible]	7/1/86	SIZE B / CODE IDENTIFICATION 01961 / DRAWING NUMBER PE-64309 / REV N	
	REF: CUSTOMER ROCKWELL DRAWING 251-8079-010 REV E DATE _____ ☐ EXCEPTIONS; NOTE _____			SCALE = NONE	SHEET 1 of 3

F20065-1

WINDING DATA

MANDREL: _____ FORM: _____ CORE: _____

WINDING				
WIRE SIZE				
TRAVERSE				
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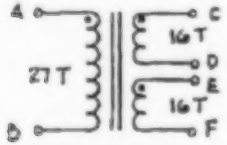
LAYER INSULATION	FOR LATEST DESIGN			
NUMBER OF LAYERS				
TOTAL TURNS				
WRAPPER				
LEAD IDENTIFICATION				



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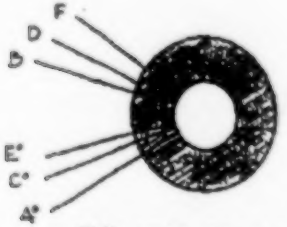
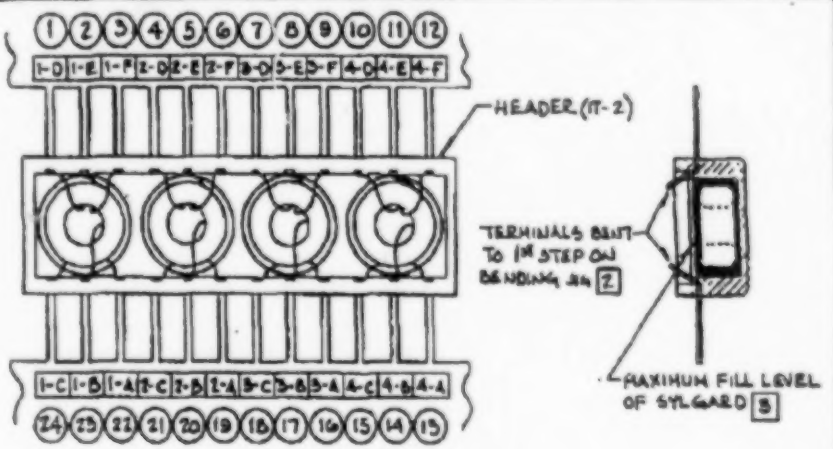


TYP. LEAD BREAKOUT

FIG. 1



ASSEMBLY VIEW FIG. 2

ASSEMBLY NOTES

1.0 INSERT 4 COATED COILS INTO BOBBIN & TERMINATE EACH PART PER FIG. 2, COIL SHOULD BE HELD ON PLACE WITH A SMOOTH WOODEN ROD.

2 AFTER ALL COILS ARE TERMINATED, SOLDER ALL CONNECTIONS WITH ITEM-6, DIP SOLDER, BEND INTERNAL TERMINALS DOWN (1ST STEP), CLEAN EXCESS FLUX USING ULTRASONIC CLEANER. DO NOT USE BRUSHES!!

3 COAT COILS WITH ITEMS 7&8, CURE 20 MIN. @ 75°C ± 5°C.

4.0 STAMP UNITS PER FINAL OUTLINE.

5.0 BEND LEADFRAME TO POSITION SHOWN IN FINAL OUTLINE, USE JIG JH-17880 FORMING AND TRIMMING DIE TO SHIP TUBE. NOTE: PARTS MUST BE TRANSPORTED & HANDLED WITH CARE AFTER THIS POINT TO ASSURE THAT DIE PINS DO NOT BECOME MISALIGNED. HANDLE & TRANSPORT IN SHIPPING TUBES ONLY

□ = NUMBERS IN SQUARES EQUAL CORE NUMBER AND LEAD IDENTIFICATION 1-A IS CORE NUMBER 1 AND LEAD A.

○ = CIRCLE NUMBERS EQUAL TERMINAL NUMBERS.

6.0 TEST 100% PER TEST NOTES: 1.0 & 6.0

7.0 SAMPLE TEST PER TEST NOTES: 1.0, 3.0, 4.0, 5.0, 7.0 &

SIZE	DWG. NO.	REV
B	01961	64309

SCALE: NONE SHEET 2 OF 3

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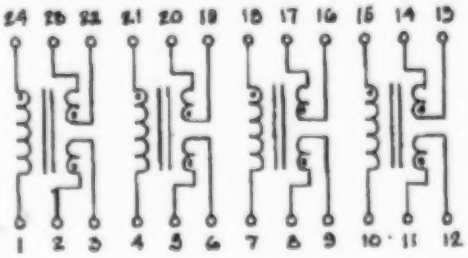
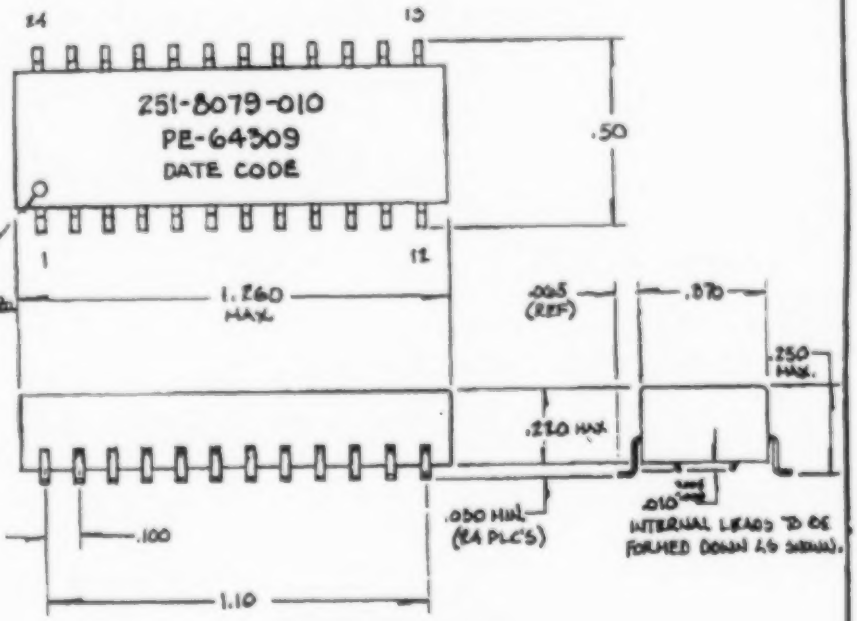


SCHEMATIC



FINAL OUTLINE

FIG. 3

TEST NOTES

1.0 TURNS RATIO:
$\frac{24-1}{22-23} = \frac{2-3}{21-23} = \frac{21-4}{19-20} = \frac{5-6}{19-20} = \frac{18-7}{16-17} = \frac{8-9}{16-17} = \frac{15-10}{13-14} = \frac{11-12}{13-14} = .588 \pm 2\%$

2.0 INDUCTANCE: .04 VRMS @ 1 KHz
(13-14) = (16-17) = (19-20) = (22-23) = 0.8 mH MIN.

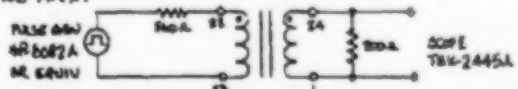
3.0 LEAKAGE INDUCTANCE: 100 KHz, .02 VRMS HP4277A
(22-23) TO (24-1) (2-3) SH
(19-20) TO (21-4) (5-6) SH
(16-17) TO (18-7) (8-9) SH
(13-14) TO (15-10) (11-12) SH
} = 1.5 μH MAX.

4.0 C$_{WW}$: 100 KHz, .02 VRMS HP4277A
PRIMARIES TO SECONDARIES = 40 PF MAX.

5.0 D.C. RESISTANCE:
(22-23) = (19-20) = (16-17) = (13-14) = 0.8 Ω MAX.
(24-1) = (21-4) = (18-7) = (15-10)
(2-3) = (5-6) = (8-9) = (11-12)
} = 0.2 Ω MAX.

6.0 HIPOT:
WINDING TO WINDING = 200 VRMS 60 SEC
220 VRMS 1 SEC

7.0 RISE TIME: 9 NS MAX.



8.0 ET: (22-23) = (19-20) = (16-17) = (13-14) = 4 V μSEC MIN.

9.0 PACKAGING: SEE PROCEDURE P-2113,

10.0 I.R.
WINDING TO WINDING = 100 MEGOHMS MIN. 200 VDC.

SIZE	CAGE IDENTIFICATION	DRAWING NUMBER	REV
B	01961	64309	M
SCALE: NONE		SHEET 3 of 3	

P30064-B

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

Defendant's Trial Exhibit
DTX 533
2:07-cv-00331-PMP-PAL

ELECTRONIC PACKAGING AND INTERCONNECTION HANDBOOK

CHARLES A. HARPER
EDITOR IN CHIEF

TECHNITROL-PULSE
4187903

DTX-533

PLACE HOLDER

(BOOK)

[Bar Code]

ELECTRONIC PACKAGING AND INTERCONNECTION HANDBOOK

CHARLES A. HARPER
EDITOR IN CHIEF

TECHNITROL-PULSE
4187903

ELECTRONIC PACKAGING AND INTERCONNECTION HANDBOOK

Charles A. Harper Editor-in-Chief
Technology Seminars, Inc., Lutherville, Maryland

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Charles A.
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CIP

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ISBN 0-07-026684-0

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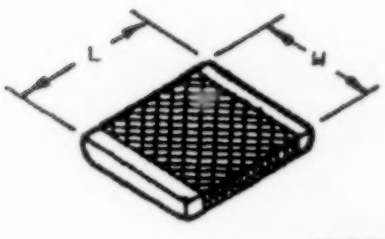
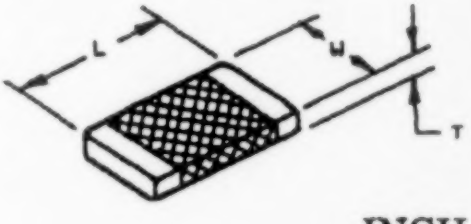


INCH
MM

CASE SIZE	L	W
0805 2012	.017 2.00	.049 1.25
1206 3216	.126 3.20	.063 1.60
1210 3225	.126 3.20	.098 2.50

FIGURE 9.21 Standard Multilayer inductors.



INCH
MM

CASE SIZE	L	W	T
0805 2012	.079 2.00	.049 1.25	.035 .900
1206 3216	.126 3.2	.063 1.60	.043 1.09
1210 3225	.126 3.20	.098 2.50	.051 1.29
1812 4532	.177 4.50	.126 3.20	.059 1.50

FIGURE 9.22 Standard chip ferrite beads.

9.2.2.4 Transformers. Small conventional transformers have been converted to SMT. There are many configurations available in closed-case and open-case packages (Fig. 9.23).

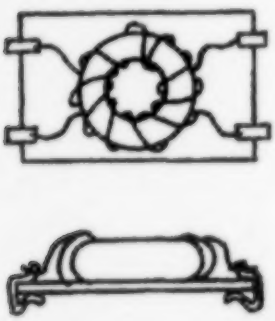


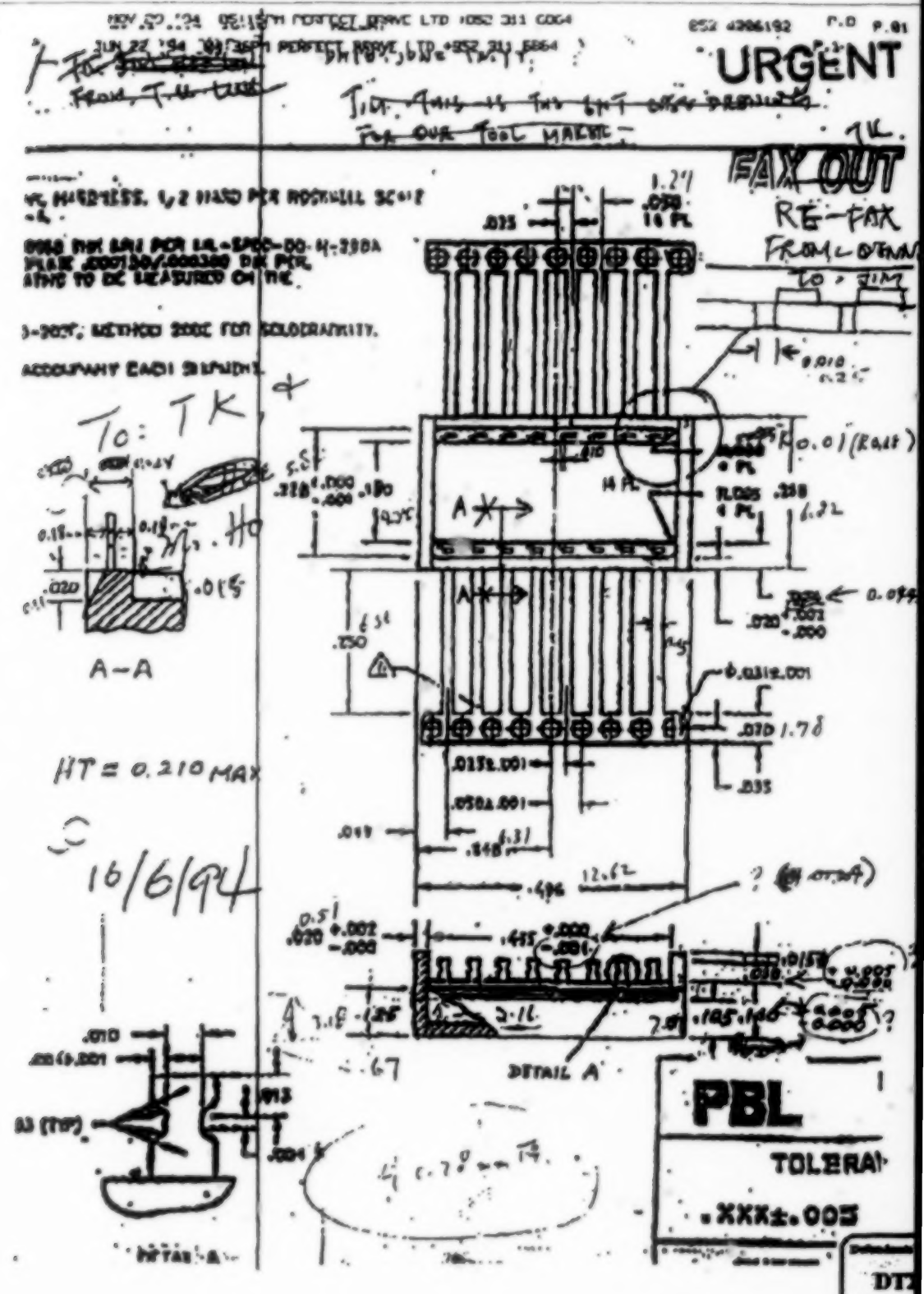
FIGURE 9.23 Open-frame transformer.

9.2.2.5 Crystals. Leaded surface-mount crystals are supplied in various packages, including ceramic and high-temperature plastic.

9.2.2.6 Other Components. Hermetically sealed lithium batteries are available in SMT case sizes of 16 by 16 by 7.5 mm with a 3-V cell capacity up to 5000 mA. Surface-mount fuses are available in 0.5- to 5-A ratings.

9.2.2.7 Connectors. Surface-mount connectors are required to have the following unique features, which are not normally found in traditional connectors:

1. Surface attachment of connection to substrate
2. Large I/O pin count, 300 and up
3. Low profile


URGENT
FAX OUT
RE-FAX
A-A
DETAIL A
PBL
TOLERAN
.XXX±.005

FROM : PETER LU

PHONE NO. : 214 355 3296

Jim, this is the 5th case ...

For our tool maker.

...HARDNESS, 1/2 HARD PER ROCKWELL SCALE B=4.

...250 THK UNI PER MIL-SPEC-00-H-290A ...PLATE .000180/.000300 THK PER ...PLATING TO BE MEASURED ON THE

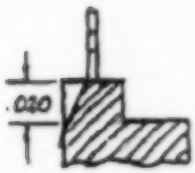
...TD-2026, METHOD 2026 FOR SOLDERABILITY.

...ACCOMPANY EACH SHIPMENT.

11/28/94

(.228 - .180)/2

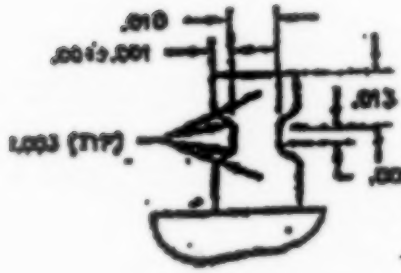
= 0.024" wall thickness



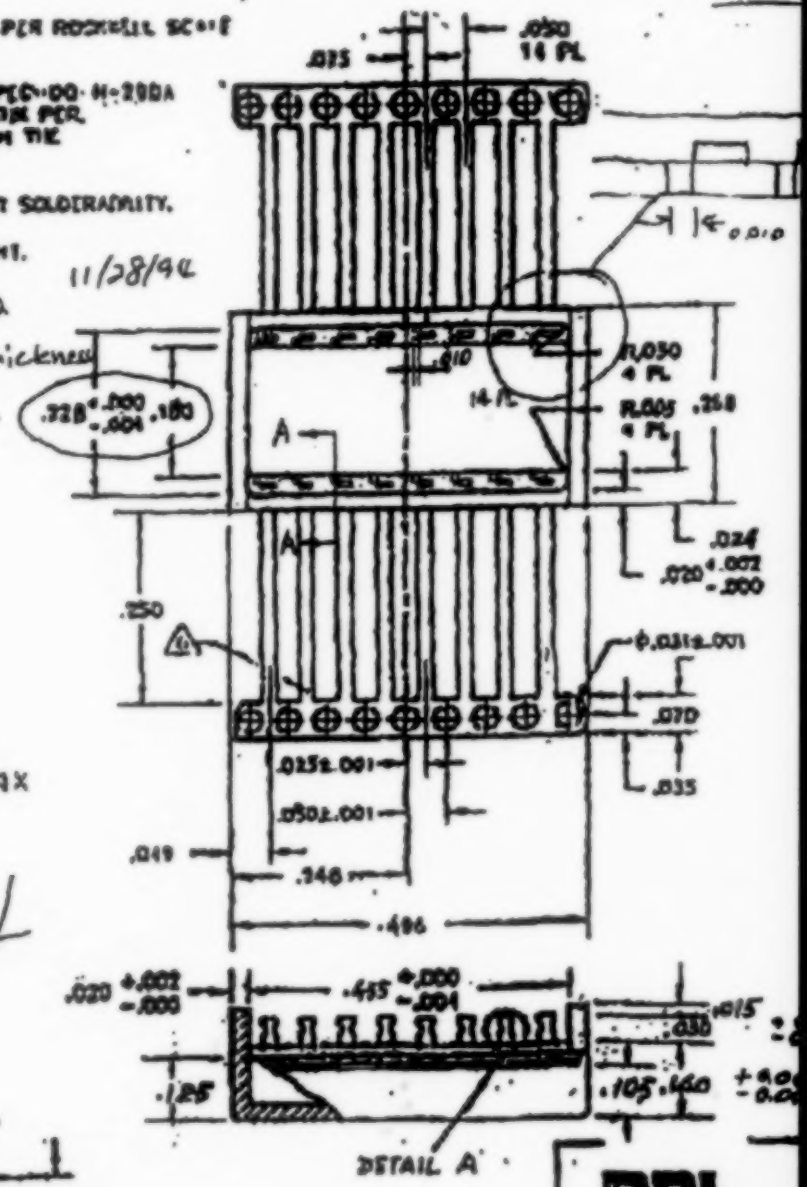
A-A

HT = 0.210 MAX

10/6/94



DETAIL A



PBL

TOLE

.XXX±.00

SHEET

UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

(Admitted Into Evidence On 11/7/12)

Defendants' Trial Exhibit

DTX-559

2:07-cv-00331-PMP-PAL

DWG NO	SHT	REV
300-0010	1	[Illegible]

		REVISIONS				
		REV	DESCRIPTION	DATE	APPROVED	RELEASED
		X	PROTO RELEASE	10/26/89	B	L Lam
		A	PRODUCTION RELEASE RED 12-10-85	12/14/89	P.B.	

To: Neal Lam
Attn: Mr. Andy Lam
From: Randy [Illegible] – Valor East

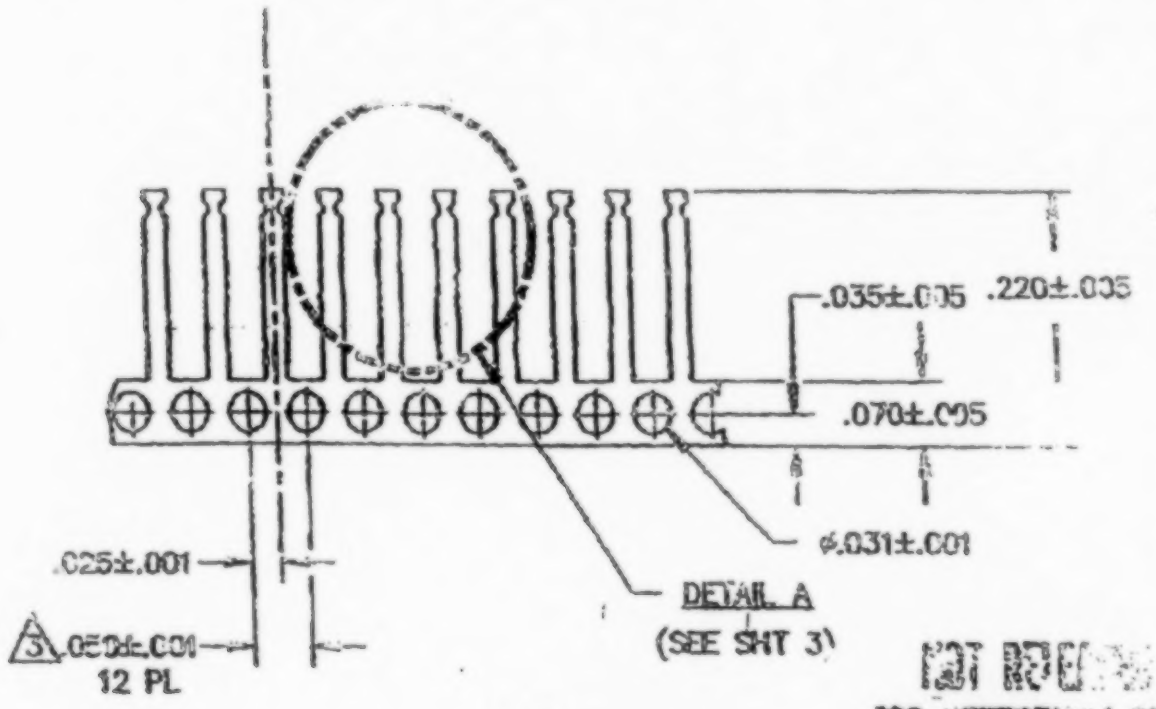
NOT RELEASED
FOR REFERENCE ONLY

CANCELLED

SPECIFICATION CONTROL DRAWING

[ILLEGIBLE]	UNLESS OTHERWISE SPECIFIED			APPROVALS	DATE	[LOGO] VALOR		
	TOLERANCES ARE			DRAWN BY	10-26-83	[Illegible]		
						]Illegible]		
	INCHES	METRIC	ANGLES	CHECK BY	[Illegible]	[Illegible]		
	.X ± .1	[Illegible]	X. ± [Illegible]					
[ILLEGIBLE]	.XX ± .020			DSGN BY	[Illegible]	TITLE		
(First [Illegible]	.XXX ± .558	[Illegible]	X.X ± [Illegible]	PB		LEAD [Illegible]		
	DO NOT SCALE DRAWING			PROJ ENGR BY	[Illegible]	RECEIVED		
	MATERIAL			SAFETY				
[ILLEGIBLE]	[1]			QA	32108183	SIZE	CODE IDENT NO.	DRAWING NO. / REV
[Illegible]				[Illegible]		A	15003	300-0010 / A
	FINISH			[Illegible]	10/25/9	[Illegible]		SHT
	[2]			PB		None		OF
				[Illegible] ENGR	10/25/9			[Illegible]
				PB				

0035 300-0010 Pg 2



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SPECIFICATION CONTROL DRAWING

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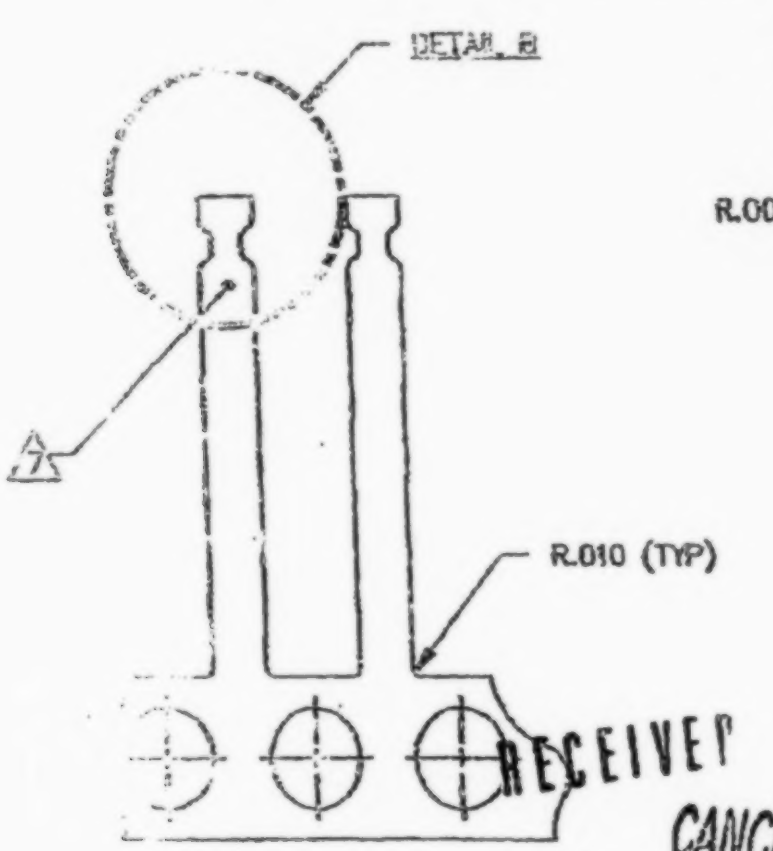
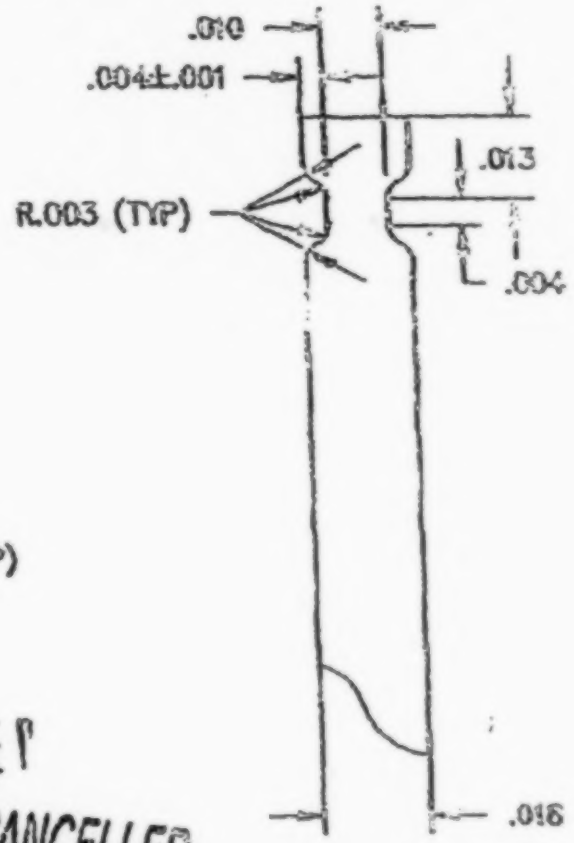
SHEET NONE		





DETAIL A
(SEE SHT 2)

DETAIL B

RECEIVED
CANCELLED

SPECIFICATION CONTROL DRAWING

SIZE			
A	15003	300-0010	A

SCALE NONE

DWG NO.	SHT	REV
300-0010	4	A

NOTES:

1. ALLOY 42, .00764±.0086 THK, HARDNESS, 1/2 HARD PER ROCKWELL SCALE.
2. [ILLEGIBLE] NICKEL AT .000050 THK MIN PER MIL-SPEC-00-N-200A THICKNESS OF PLATING TO BE MEASURED ON THE SHOULDER OF THE LEADFRAME
3. ACCUMULATION NOT TO EXCEED 1.200±.002 OVER 24 LEADS.
4. LEAD FRAME MUST PASS MIL-STD-202, METHOD 208F FOR SOLIDERABILITY.
5. CERTIFICATE OF COMPLIANCE TO ACCOMPANY EACH SHIPMENT.
6. GRINDER – 1/4 INCH MAX OVER 18 INCHES.
7. [ILLEGIBLE] CHECK POINT.
8. MAXIMUM BURR OF .001.

CANCELLED

RECEIVED

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SPECIFICATION CONTROL DRAWING

SIZE	CODE IDENT NO.	DRAWING NO.	REV
A	15003	300	A

SCALE		SHT	OF
NONE		4	5

DWG NO.	SHT	REV
300-0010	5	A

APPROVED VENDOR LIST		
VENDOR	PART NO.	NOTES
ONE TECH	SK-09-0081	

CANCELLED

RECEIVED

NOT RELEASED
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SPECIFICATION CONTROL DRAWING

	SIZE	CODE IDENT NO.	DRAWING NO.	REV
	A	15003	300	
	SCALE NONE		SHT	OF

Defendant's Trial Exhibit
DTX-563
2:07-cv-00331-PMP-PAL

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

(Admitted Into Evidence On 11/15/12)

DWG NO ST7047	SHT 1	REV 03

REVISIONS

REV	DESCRIPTION	DATE	APPROVED	RELEASED
01	PILOT RELEASE *4/2/93 C.M.*	4/2/93	RAL	3/31/93
02	PER ECO VS0214 *4/15/93 C.M.*	4/28/93	TD	YVONNE
02	PER ECO VS0262 *5/20/93 G.M.*	5/25/93	TD	L. KARR

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DIMENSIONS ARE INCHES
TOLERANCES ARE:

INCHES	METRIC	ANGLES
.x ±.03	[x.xx] ±.13	x. ±1.0°
.xx ±.02	[x.x] ±.5	x.x±9.30°
.xxx ±.005		

DO NOT SCALE DRAWING

MATERIAL
[1] SHT 3

FINISH
[2] SHT 3

APPROVALS	DATE
DRAWN BY C. MATA	*6/5/92*
CHECK BY L.CHAVEZ	*6/9/92*
DSGN BY ——	—
PROJ ENGR T.WEISLER TD	*6/9/92*
ENGR MGR AL PETERSEN	*6/9/92*
G.A. TOM K.	*3/31/93*
MFG ENGR JAVIER	*3/31/93*

[LOGO] VALOR
VALOR ELECTRONICS, INC. 8715 BUSINESS PARK AVE. SAN DIEGO, CA 02131

TITLE
TRANSFORMER, LAN

SIZE	CODE IDENT. NO.	DRAWING NO.	REV
A	15003	ST7047	03

SCALE		SHT OF
NONE		1 8

DWG NO ST7047	SHT 2	REV 03

DASH NO.	CUSTOMER		
	CUSTOMER	P/N	REV
—	CATALOG	N/A	N/A
001	CATALOG	N/A	N/A

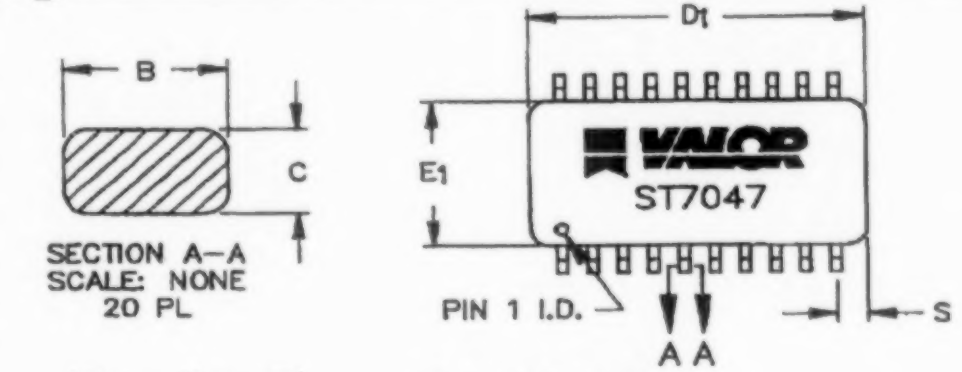
CONFIGURATION SPECIFICATIONS

FOR INTERNAL USE ONLY

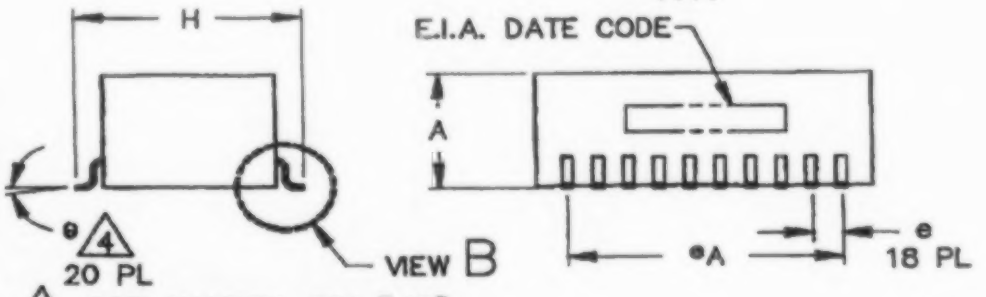
SIZE	CODE IDENT. NO.	DRAWING NO.	REV
A	15003	ST7047	03

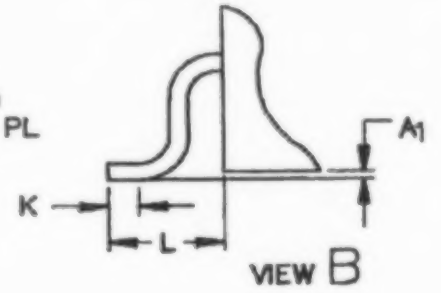
SCALE		SHT	OF
NONE		2	8

DWG NO ST7047 SHT 3 REV 03



DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.205	.225	5.21	5.72
A_1	.004	.010	.10	.25
B	.016	.020	.41	.51
C	.008	.012	.20	.30
D_1	.590	.610	14.99	15.49
E_1	.280	.280	6.60	7.11
e	.045	.055	1.14	1.40
eA	.445	.455	11.30	11.56
H	.360	.380	9.14	9.65
K	.015	.025	.38	.64
L	.045	.055	1.14	1.40
θ	0°	8°	0°	8°
S	.070	.080	1.78	2.03





4 COPLANARITY .004 [.10].

3. LETTER DESIGNATIONS FOR PACKAGE DIMENSIONS CONFORM TO JEDEC PUBLICATION NO.95 SECT 2.2.

2 LEAD : SOLDERABILITY PER MIL–STD–202, METHOD 208.

1 CASE : BLACK PLASTIC, SELF–EXTINGUISHING PER UL94V–0.
LEAD : KOVAR, ALLOY 42 OR EQUIVALENT.

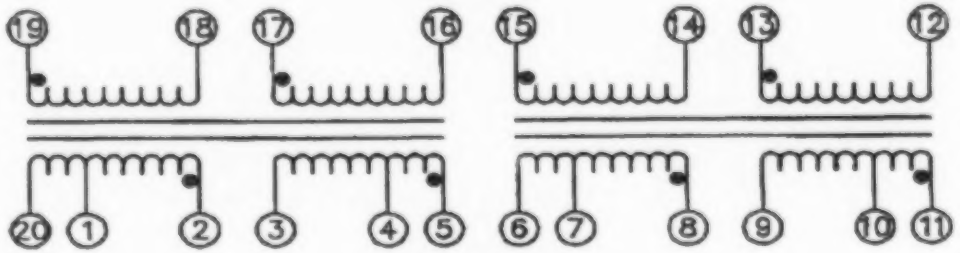
NOTES: UNLESS OTHERWISE SPECIFIED

MECHANICAL

SIZE	CAGE CODE NO.	DRAWING NO.	REV
A	15003	ST7047	03
SCALE NONE		SHT 3 OF 8	

DWG NO ST7047 SHT 4 REV 03

SECONDARIES



PRIMARIES

PERFORMANCE SPECIFICATIONS @ 25°C

HIPOT	: 500VRMS (WINDING – WINDING)		
DCR (PRIMARIES)	: 0.4Ω MAX		
(SECONDARIES)	0.8Ω MAX		
* INSERTION LOSS	: –0.5dB MAX, 1 – 20MHz (EACH TRANSFORMER)		
* RETURN LOSS (1 – 8MHz)	: 22dB MIN	}	THRU BOTH TRANSFORMERS IN
(8 – 16MHz)	20dB MIN	}	LOOP–BACK CONNECTION.
(16 – 24MHz)	18dB MIN	}	

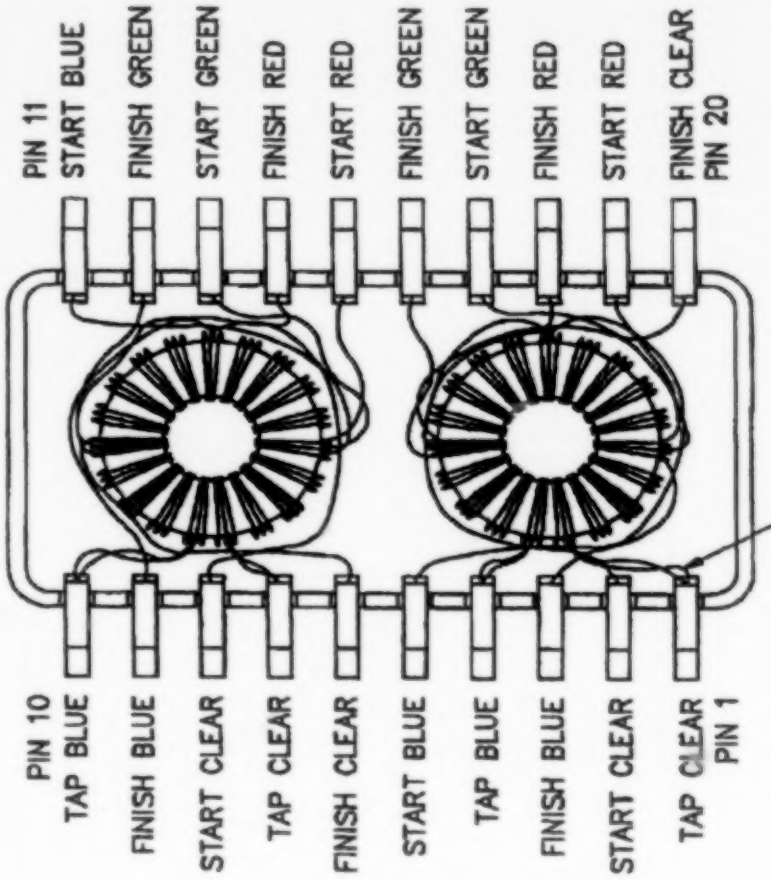
* INSERTION LOSS AND RETURN LOSS SPECIFICATIONS BASED ON 150Ω LOAD ON ONE SECONDARY FOR EACH TRANSFORMER AND PRIMARIES DRIVEN FROM 150Ω SOURCE TO 20–5 OR 6–11 OR FROM 100Ω SOURCE TO 1–4 OR 7–10, WITH 2–3 CONNECTED AND 8–9 CONNECTED.

ELECTRICAL

SIZE	CAGE SHT NO.	DRAWING NO.	REV
A	15003	ST7047	03
SCALE NONE		SHT 4 OF 8	

[LOGO]		001	002	03	BILL OF MATERIALS			CODE IDENT NO. 15003	DWG NO ST7047	SHT 5	REV 03
ITEM	QTY	QTY	QTY	QTY	U/M	PART NO	REV	DESCRIPTION			
1	2	2			EA	011-0103		CORE, TOROID, FERRITE COATED			
2	1	1			EA	110-0294		CASE, 20 PIN			
3	.0002	.0002			LB	121-3642		WIRE, #36HN, BLUE			
4	.0002	.0002			LB	121-3692		WIRE, #36HN, CLEAR			
5	1.5	1.5			FT	123-3722		WIRE, DUAL, #37HN, RED AND GREEN			
6	AR	AR			LB	180-2701		SOLDER, 10/88/2			
7	AR	AR			GAL	200-0001		EPOXY			
8	AR	AR			GAL	205-0001		HARDENER			
9											
10	AR	AR			OZ	220-0001		INK, WHITE MARKING			
11	.032	—			EA	999-4111		TUBE, SHIPPING			
12	.064	—			EA	999-4086		PIN, SHIPPING TUBE			
13	REF	REF				TPST7047		TEST PLAN			
14	1	1			EA	300-0031		LEADFRAME, 20-PIN, SINGLE FRAME			
15	—	.002			EA	510-4003		ASSY, TAPE AND REEL			
16	REF	REF			EA	006-0359		ARTWORK, UNIT ID			
17	AR	AR			OZ	220-0004		INK, WHITE SILKSCREEN			
18	REF	REF			EA	300-0010		LEADFRAME (ALT ITEM 14)			
19	AR	AR			GAL	207-0002		GEL, DIELECTRIC, PART A			
20	AR	AR			GAL	207-0003		GEL, DIELECTRIC, PART B			
21											
22											
23											
24											
25											
26											
27											

DWG NO ST7047 SHT REV 03



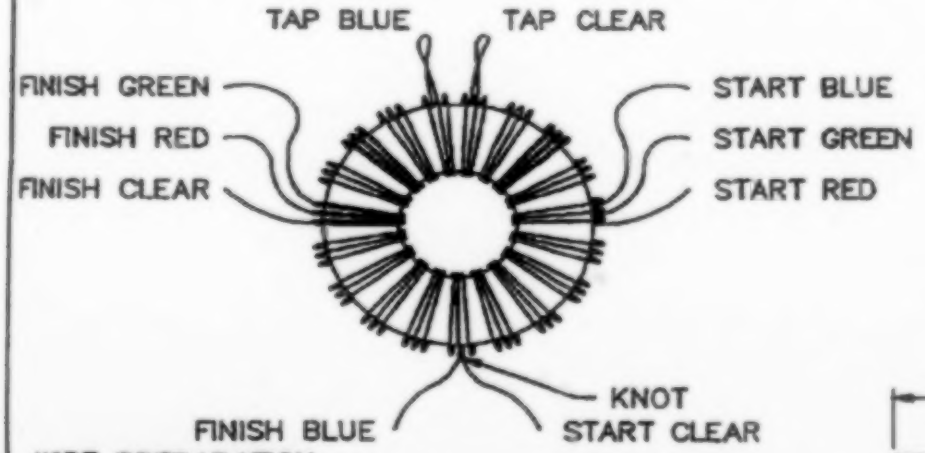
INSTALLATION INSTRUCTIONS

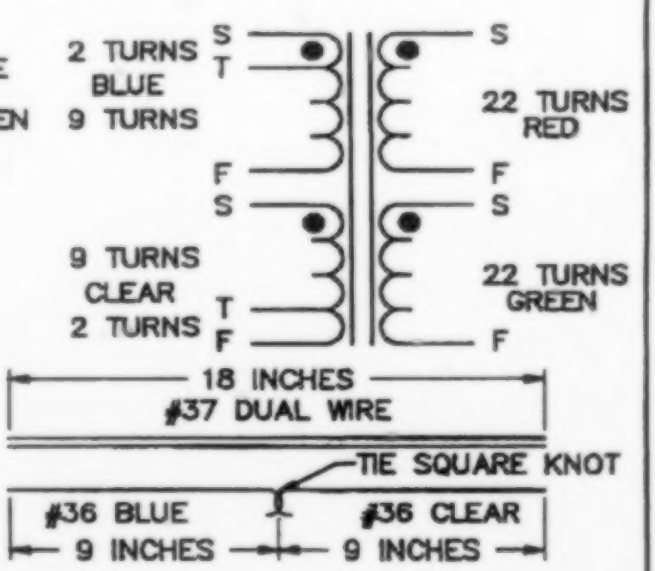
1. ASSEMBLE PER VALOR SPEC #000-0019. SOLDER EACH PAIR OF TAP LEADS UP TO WITHIN 0.1 INCH OF THE CORE.

ASSEMBLY

SIZE	CAGE IDENT NO.	DRAWING NO.	REV
A	15003	ST7047	03
SCALE NONE		SHT 6 OF 8	

DWG NO ST7047 SHT REV 03





WIRE PREPARATION

1. CUT 18 INCHES OF DUAL WIRE (ITEM 5) AND 10 INCHES EACH OF #36 WIRES (ITEMS 3 AND 4) AND PREP AS SHOWN. MACHINE TWIST THE WIRES TOGETHER FOR 190 TURNS @ 10 TURNS/INCH TO FORM ONE CABLE.

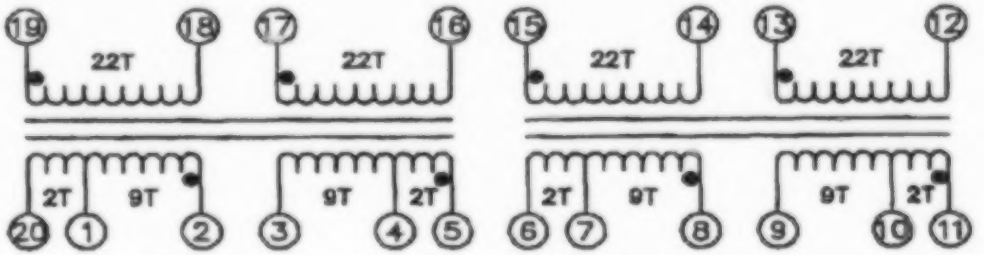
WINDING INSTRUCTIONS (WIND TWO UNITS)

1. START WINDING CABLE AT KNOT AND WIND BOTH WAYS 9 TURNS FOR A TOTAL OF 18 TURNS OVER A FULL 360°.
2. AT THIS POINT UN-TWIST THE DUAL #37 WIRES FROM THE #36 WIRES AND PULL TAP LEADS FOR THE BLUE AND CLEAR WIRES.
3. CROSS OVER TAPS AND FINISH WINDING ALL WIRES 2 MORE TURNS OVER 90° OF CORE.
4. DIP WOUND COILS IN GEL (ITEMS 19 AND 20) AND CURE PER VALOR SPEC 000-0032.

WINDING

SIZE	CAGE CODE NO.	DWG NO.	REV
A	16003	ST7047	03
SCALE NONE		SHT 7 OF 8	

DWG NO	ST7047	SHT 8	REV 03



OCL (19–18) AND (15–14)	: 400μH MIN @ 25mV MAX, 10KHz
PHASING	: 20 AND 3–18 AND 16; 6 AND 9–12 AND 14
TURNS RATIO	: 2 : 9 : 22 ± 1%
LL (20–5) WITH (2–3) CONNECTED	: 0.30μH MAX @ 1MHz MIN SHORT (16–17) OR (18–19)
LL (1–4) WITH (2–3) CONNECTED	: 0.20μH MAX @ 1MHz MIN SHORT (16–17) OR (18–19)
LL (6–11) WITH (8–9) CONNECTED	: 0.30μH MAX @ 1MHz MIN SHORT (12–13) OR (14–15)
LL (7–10) WITH (8–9) CONNECTED	: 0.20μH MAX @ 1MHz MIN SHORT (12–13) OR (14–15)
Cww (18–20) OR (16–20) WITH (2–3) SHORTED	: 30pF MAX @ 10KHz
Cww (15–11) OR (13–11) WITH (8–9) CONNECTED	: 30pF MAX @ 10KHz
DCR (PRIMARIES)	: 0.40Ω MAX
DCR (SECONDARIES	: 0.80Ω MAX
HIPOT	: 500VRMS (WINDING – WINDING)

PRODUCTION TEST SPECIFICATIONS

SIZE	CAGE PART NO.	DRAWING NO.	REV
A	15003	ST7047	03
SCALE NONE		SHT 8 OF 8	

UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

(Admitted Into Evidence On 11/14/12)

4 | 3

Pulse Engineering, Inc.,
San Diego, California 92112

CUSTOMER **WESTERN ELECTRIC**
JOB NUMBER _____

PE- 60589
REV F
9-10-80

LIST OF MATERIALS

ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION	SPECIFICATION OR NOTES
1	2	WCI-60589	WOUND COIL ASSEMBLY	[1]
2	1	043-0460	14 PIN HEADER CASE	*
3	L/R	081-0098	SYLGARD 184 DOW CORNING	P-20606
4				
5				
6	L/R	083-0016	SOLDIER 60/40	P-60607
7	L/R	082-0002.001	INK MARKEM 7254	FRS 100K (WHITE)
8	L/R	083-0017	FLUX KESTER 1015	P-60607
9	L/R	083-0015	FLUX KESTER 197	P-60607

TEST FIXTURES AND/OR PROCEDURES

TOOLING REQUIRED

[ILLEGIBLE] – SOLDER FIXTURE } CJM 17146
SOLDER MASK ----------
00 – [ILLEGIBLE] FIXTURE A-JM-17117

REFERENCE DOCUMENTS

[1] CORES TO BE SINE GRADED USING GRADING FIX. B-JE-15344-H AND LIMITS PER GRADING TABLE ON SHT. 2 INCOMING INSPECTION TO RUN T.C. ON EACH CORE NOT TO DETERMINE WHETHER GRADE LIMITS ADJUSTMENTS WILL BE NECESSARY. DEGAVSS BEFORE GRADING WAIT 2 HR. MINIMUM

FIXTURES		
1.0	JM – 16510	PRI INDUCTANCE
2.0	JM – 16511	LLI JM – 16509 – LL2
3.0	JM – 16512	INTERWINDING CAPACITANCE
4.0	JM – 16513	INSULATED RESISTANCE
5.0	JM – 16522	TURNS RATIO

ASSEMBLY PROCEDURE	P-20607
COIL COAT PROCEDURE	P-20606
TEST PROCEDURE	ATP-20439
CMRR PROCEDURE	P-20514

* CAN BE PROCDURED FROM PIXLEY – RICHARDS PLYMOUTH, MASS. TO WESTERN DWC. 841 789 423

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Defendants' Trial Exhibit
DTX-580
2:07-cv-00331-PMP-PAL

2 1

NOTES: UNLESS OTHERWISE SPECIFIED –

1.0 IN THE EVENT OF CONFLICT BETWEEN THIS SPECIFICATION AND THE CUSTOMER SPECIFICATION, THE LATTER SHALL GOVERN.

2.0 INTERPRET THIS SPECIFICATION PER ML-D-1000 AND STANDARDS REFERENCED THEREIN.

3.0 ALL TEST CONDITIONS PER MIL-STD-202, PARA 2.2, EXCEPT TEMPERATURE TO BE 25 ±5° C.

APPLICABLE CUSTOMER DWGS

DWG NO.	ISSUE
A 76 MG00 68	1
841 789 423	2
841 793 813	1
A76 MG00 66	1
841 571 045	1
A- 156919	1

LTR	DESCRIPTION	ECO NO.	DATE	APPROVED
F	ADDED WCI DWG PER ECN	23393	[Illegible]	[Illegible]
D	SPECIFY WIRE AMOUNT ITEM #415	19063	[Illegible]	[Illegible]
C	CHG PER ECN	18998	[Illegible]	[Illegible]
B	CHG. PER ECN	18969	[Illegible]	[Illegible]
A	TO AGREE NEW CUST. SPEC'S	18934	[Illegible]	[Illegible]

REV STATUS	REVISION	F	F	A																				
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

UNLESS OTHERWISE SPECIFIED, DIMENSIONS IN INCHES BEFORE PLATING. TOLERANCES ON:
FRACTIONS = ± 1/64
ANGLES = ± 10
DECIMALS: 0.XX = ± .01
0.XXX = ± .005

DRAWN Pacho	DATE	Pulse Engineering, Inc.
CHECKED		San Diego, California 92112
ENGRG APPD R. Procter	11/21/75	TITLE
PROJ APPD		WESTERN ELECTRIC 2656 N 2 TRANSFORMER PKG.
APPROVED		

REF: CUSTOMER WESTERN UNION DRAWING SEE ABOVE REV _____ DATE ____ ☐ EXCEPTIONS: NOTE ____	SIZE B	CODE IDENTIFICATION 01961	DRAWING NUMBER PE-60589	REV F
	SCALE =		SHEET 1 of 3	

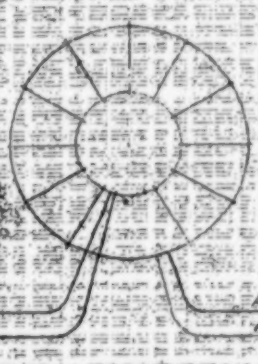
WINDING DATA

MANDREL: _____ FORM: _____ CORE: _____

	N_1	N_2		
WIRE SIZE	31 H (ITEM 4) Ø.	31 H (ITEM 5) Ø.		
TRAVERSE	3.50	3.50		
TURNS PER LAYER				
LAYER INSULATION				
NUMBER OF LAYERS				
TOTAL TURNS				
WRAPPER				
LEAD IDENTIFICATION	A	B	C	D

BIFILAR

WINDING DIAGRAM



TYP. LEAD BREAKOUT

FIG. 1

WINDING NOTES:

1.0 WIND N_1 & N_2 EVENLY & SNUGLY PER ABOVE DATA.

2.0 WDGS. MUST BE KEEPT TOGETHER & EVENLY DISTRIBUTED TO MEET EMRR REQUIREMENTS

3.0 REF. FIG 1 FOR TYP. LEAD BREAKOUT.

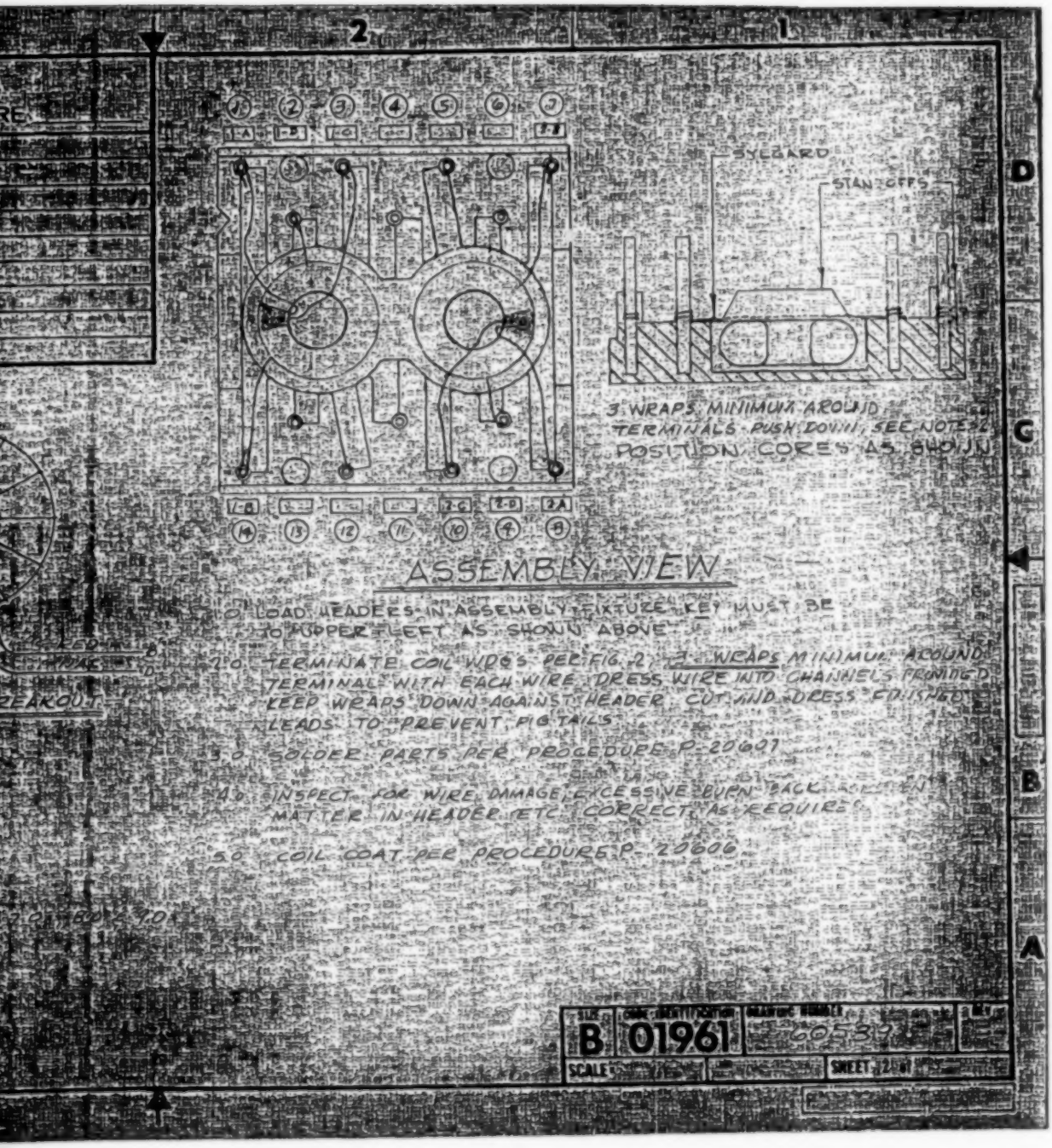
4.0 REPEAT ABOVE PROCEDURE FOR COIL #2

5.0 SAMPLE TEST PER NOTES 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 & 9.0

SEE NOTE ON SHT 1 FOR TC ADJUSTMENT

GRADING TABLE		
N	MIN	MAX
10	34	36
11	30	33

F20065-3


SLEEVE
STANDOFFS
3 WRAPS MINIMUM AROUND TERMINALS PUSH DOWN, SEE NOTE 2
POSITION CORES AS SHOWN
ASSEMBLY VIEW
1.0 LOAD HEADERS IN ASSEMBLY FIXTURE KEY MUST BE TO UPPER LEFT AS SHOWN ABOVE
2.0 TERMINATE COIL WIRES PER FIG. 2, 3 WRAPS MINIMUM AROUND TERMINAL WITH EACH WIRE DRESS WIRE INTO CHANNELS PROVIDED KEEP WRAPS DOWN AGAINST HEADER CUT AND DRESS EXCESS LEADS TO PREVENT PIG TAILS
3.0 SOLDER PARTS PER PROCEDURE P-20607
4.0 INSPECT FOR WIRE DAMAGE, EXCESSIVE BURN BACK, FOREIGN MATTER IN HEADER ETC. CORRECT AS REQUIRED
5.0 COIL COAT PER PROCEDURE P-20606
B
01961
SCALE
SHEET

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D

TEST NOTES

1.0 TURNS RATIO: TEST 100% TEST FIXTURE JM-16522 METHOD 7.0
1:1 ± 2% @20 KC

2.0 POLARITY: TEST 100% PER SCHEMATIC

3.0 PRIMARY INDUCTANCE: MEAS. ON 63H BRIDGE, RANGE X.1 TEST FIXTURE = JM-16510 METHOD 3.0

(1-14) @ 100 KHZ
(7-8) 107.015 VRMS

SAMPLE TEST IN PROCESS		100% TEST FINAL	
MIN.	MAX	MIN.	MAX.
110 MH	155 MH	85 MH	175 MH
@25° C		SAMPLE OVER TEMP. RANGE OF 0° TO 70° C	

C

4.0 LEAKAGE INDUCTANCE MEAS. ON BOONTON 71A RANGE 1MH TEST FIXTURE – JM 16511 METHOD 4.0
(1-14) WITH (2-3) SHORTED)
(7-8) WITH (9-10) SHORTED)
COMPENSATE FOR ALL FIXTURES INDUCTANCE

SAMPLE TEST	
IN PROCESS	FINAL
LL, .100 MAX.	.200 MH MAX

50 INTERWINDING CAPACITANCE: MEAS. ON BOONTON 71A TEST FIXTURE JM-16512 METHOD 5.0
BETWEEN (1-14) SHORTED AND (2-3 SHORTED)
B BETWEEN (7-8) SHORTED AND (9-10) SHORTED)

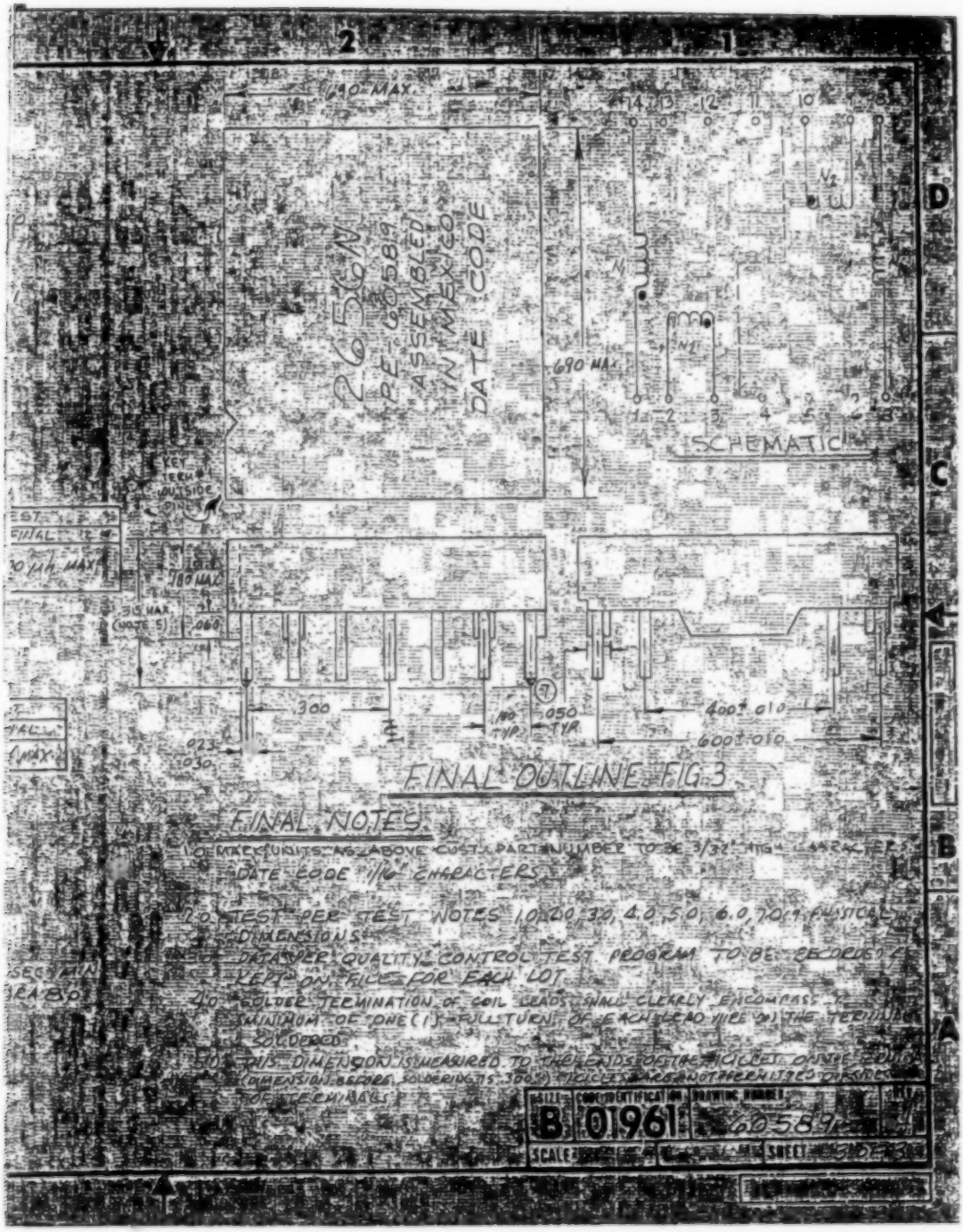
SAMPLE TEST	
IN PROCESS	FINAL
6.0 pf	15 pf MAX.

6.0 INSULATION RESISTANCE: SAMPLE TEST AT 25° C TEST FIXTURE – JM-16513 METHOD 6.0
600 MEG Ω MIN AT 500 V D.C. BETWEEN WINDINGS (1-14) TO (2-3) (7-8) TO (9-10)

A

7.0 ET WINDING (1-14) & (7-8) = 2.5 VOLTS MICRO SEC. MIN. MEASURE PER PROCEDURE ATP-20439, PARA 80

8.0 CMRR, TEST PER PROCEDURE, P-20514


2
1
.690 MAX.
.690 MAX.
SCHEMATIC
FINAL OUTLINE FIG 3
FINAL NOTES.
1. MARK UNITS ASSEMBLED ON OR AFTER DATE CODE "11G" CHARACTERS.
2. TEST PER TEST NOTES 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0. PHYSICAL DIMENSIONS.
DATA PER QUALITY CONTROL TEST PROGRAM TO BE RECORDED & KEPT ON FILE FOR EACH LOT.
4. SOLDER TERMINATION OF COIL LEADS SHALL CLEARLY ENCOMPASS A MINIMUM OF ONE (1) FULL TURN OF EACH LEAD WIRE ON THE TERMINALS SOLDERED.
5. THIS DIMENSION IS MEASURED TO THE ENDS OF THE TERMINALS (DIMENSION BEFORE SOLDERING IS .300) TERMINALS ARE NOT PERMITTED TO BEND
B 01961
60589

4 3

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WINDING DATA

MANDREL: _____ FORM: _____ CORE: ITEM 1

	WINDING	#31 H (ITEM 2) R	#31 H (ITEM 3) G		
D	WIRE SIZE	350°	350°		
	TRAVERSE				
	TURNS PER LAYER				
	LAYER INSULATION				
	NUMBER OF LAYERS				
	TOTAL TURNS	N	N		
	WRAPPER				
	LEAD IDENTIFICATION	A. B.	C. D.		

_____BIFILAR_____/

C NOTES:

1. RENT WIND PER WINDING DATA
2. ELECTRIC REQUIREMENTS
   - 2.1 SAMPLE TEST PER TEST NOTES 1.0 THRU 8.0 ON SHEET 3 OF PE-60589

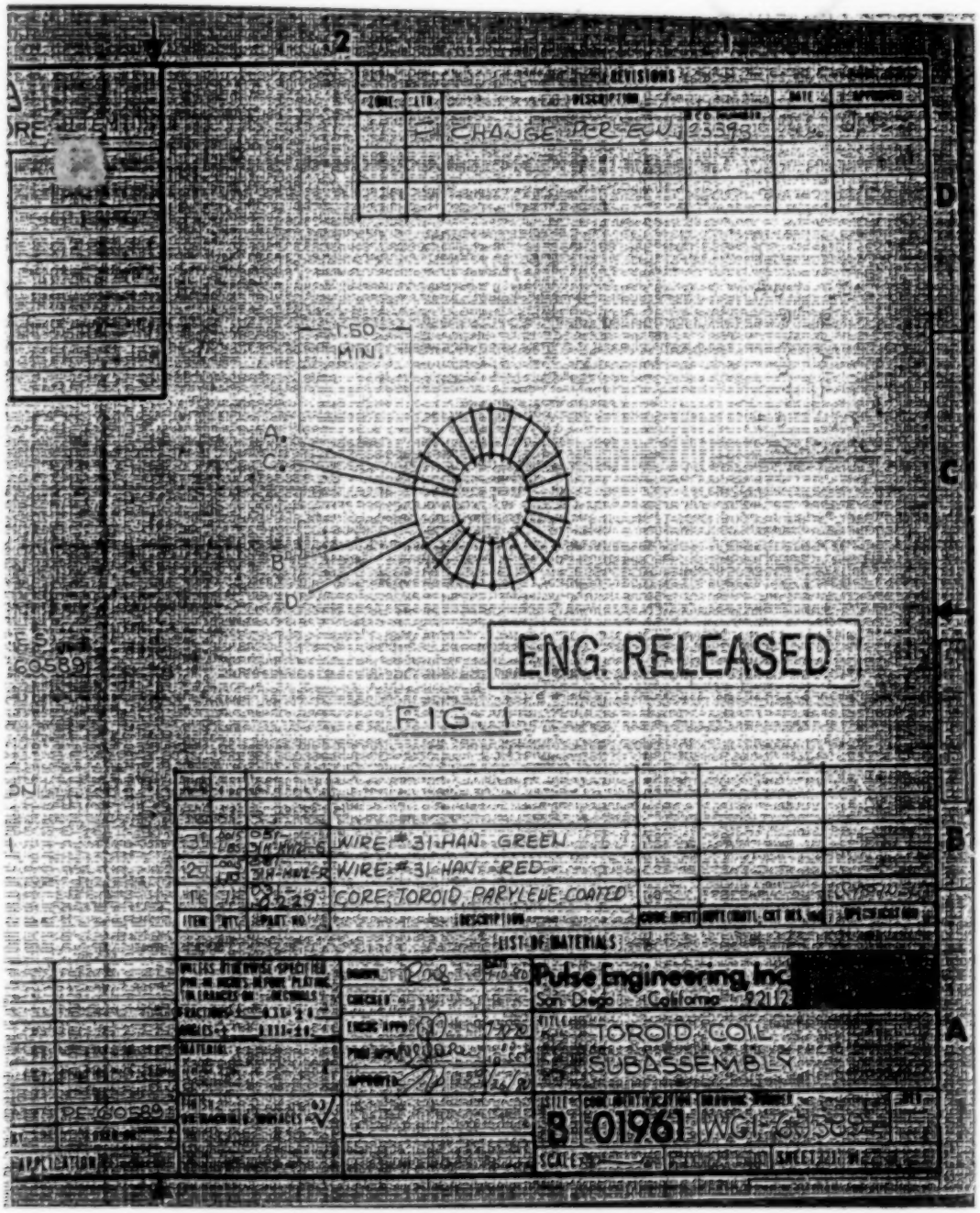
B SEE SHEET 1 OF PE-60589 FOR GRADING INFORMATION AND TO ADJUST. GRADE CORES USING FIXTURE B-JE-15344-11 TO GRADING TABLE I

TABLE I

GRADE	
N	MIN MAX
10	34 – 36
11	30 – 33
	–
	–
	–

A

	PE-60589
NEXT ASSY	USED ON
APPLICATION	


1.50
MIN.
A.
C.
B
D
ENG. RELEASED
FIG. 1
WIRE #31 HAN. GREEN
WIRE #31 HAN. RED
CORE, TOROID, PARYLENE COATED
LIST OF MATERIALS
Pulse Engineering, Inc.
San Diego, California 92128
TOROID COIL
SUBASSEMBLY
B 01961
PE-60589

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

(Admitted Into Evidence On 11/15/12)

Defendants' Trial Exhibit
DTX-605
2:07-cv-00331-PMP-PAL

HANDBOOK OF SURFACE MOUNT TECHNOLOGY

Stephen W Hinch

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and Associated Companies throughout the world.

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by
Stephen W. Hinch

Hewlett-Packard Company
Santa Rosa, California

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Technical
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* * *

. . . that allow them to be surface mounted as an integral part of the SMT process flow.

8.2.1 Conventional through-hole approach

In this approach, through-hole components are conventionally inserted after all surface mount components have been soldered. Normal through-hole insertion processes are employed, so virtually any component compatible with standard through-hole insertion can be mounted on the mixed assembly. A typical product is pictured in Fig. 8.2.

Although technologically straightforward, the actual process flow is cumbersome. Two full production lines must be supported, one for surface mount and one for through-hole. Besides the increased floor space and cost of capital equipment, engineering support must be distributed across a larger base of process technologies.

8.2.2 All SMT approach

Considerable attention has been focused on full surface mount solutions to the mixed assembly problem. Generally this involves cutting or forming the leads of through-hole devices to permit surface mounting. A typical assembly is shown in Fig. 8.3.

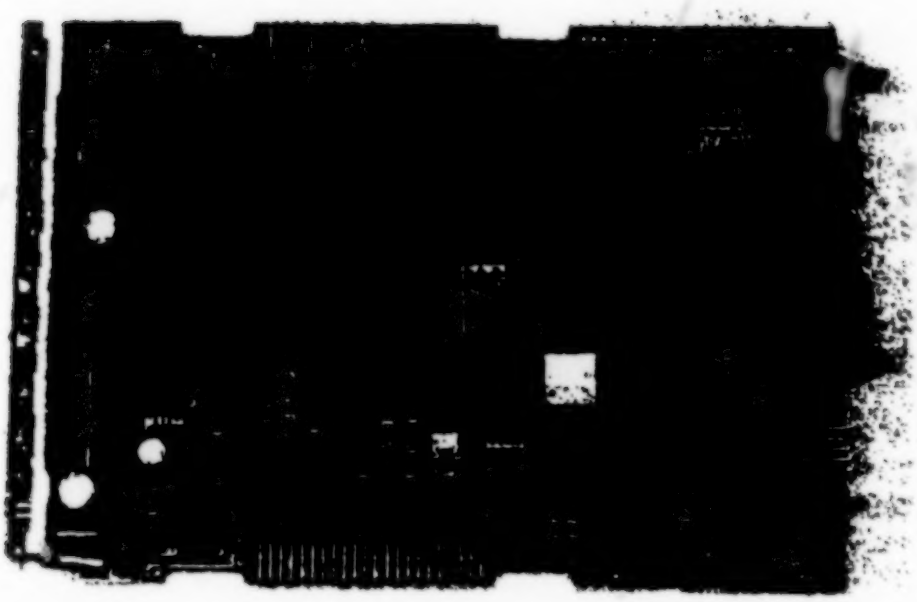

FIG. 8.2 Mixed assembly with through-hole components inserted in conventional fashion.

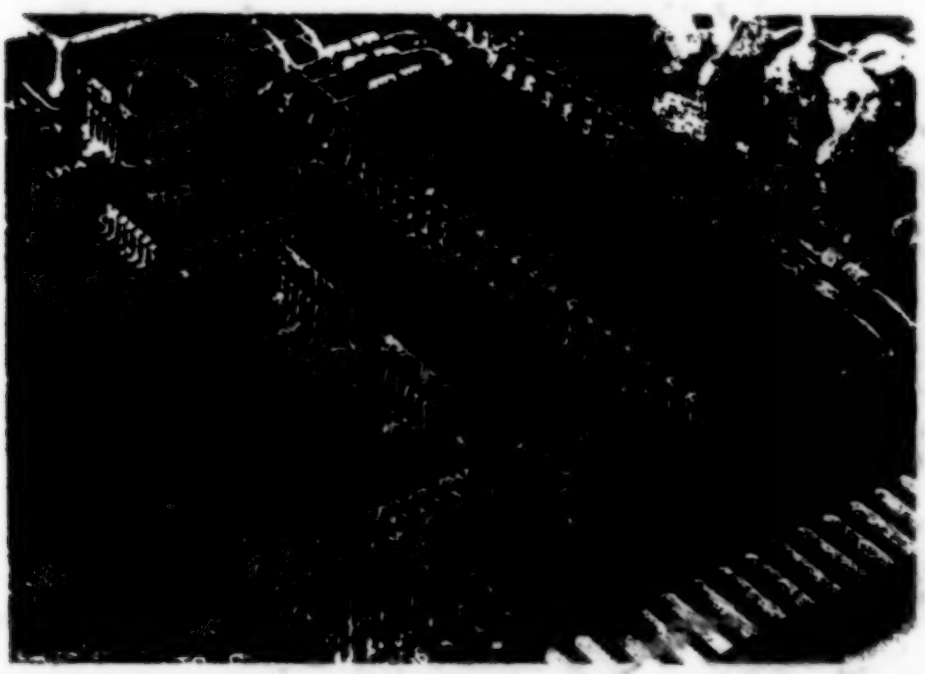

FIG. 8.3 Mixed assembly using modified through-hole components. The leads on the 40-pin DIP have

been trimmed, allowing it to be surface mounted simultaneously with the SMT components. (Photograph by the author. Board supplied by Micro Industries, Westerville, OH.)

Axial lead resistors and capacitors are surface mounted by forming their leads in gull-wing fashion, as shown in Fig. 8.4a. A flat surface is sometimes coined on the lead to increase the contact area and improve the visual inspectability of the solder joint. Dual-in-line packages can be surface mounted either by shearing to form I-lead joints or by forming them into a gull-wing configuration (Fig. 8.4b).

This approach simplifies the process flow because all devices can be attached in a single reflow process. Product designs can take better advantage of such SMT benefits as reduction in the number of via holes and

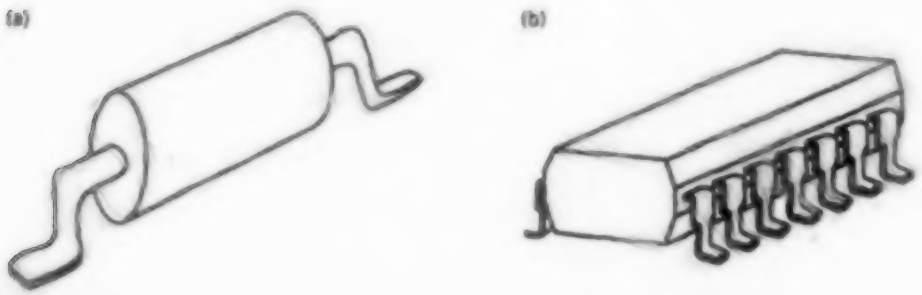

FIG. 8.4 Modification of through-hole components for surface mounting: a. axial-leaded component, b. DIP package.

UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA

(Admitted Into Evidence On 11/15/12)

Defendants' Trial Exhibit

DTX-626

2:07-cv-00331-PMP-PAL

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(19) Japan Patent Office (JP)

(11) Japanese Unexamined Utility Model Application Publication Number

H5-55513

(43) Publication date: 23 July 1993

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15/02	L	7129-5 E		

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H3-111802

(22) Date of application
21 December 1991

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Patent attorney
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---

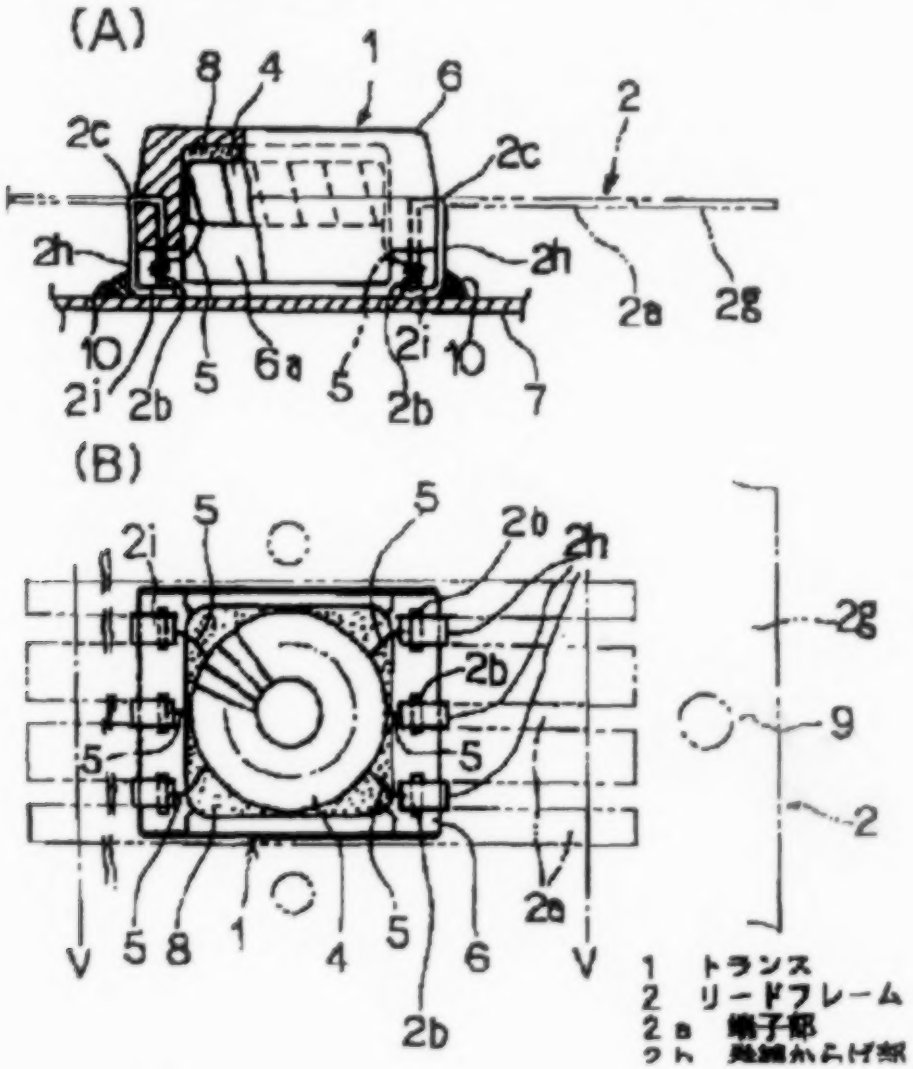
(54) [TITLE OF THE INVENTION] SMALL COIL WIRE COMPONENT

(57) [ABSTRACT]

[OBJECT] To provide a structure for a terminal portion in a small coil wire component, wherein the operation for connecting the coil wire can be performed in a continuous manufacturing process.

[CONSTITUTION] A core 4 is contained within a plastic case 6 that has an opening portion of 6a on a face that faces a substrate 7, and is secured by an adhesive 8, or the like. The coil wire 5 of the core 4 is wound onto a coil wire wrapping portion 2b, and soldered. The coil wire wrapping portion 2b of one end of the terminal portion 2a protrudes from the opening portion

side of the plastic case 6. The other end of the terminal 2 protrudes from the other face of the case 6.



1. Transformer
2. Lead Frame
2a. Terminal Portion
2b. Coil Wire Wrapping Portion
2c. Base Portion
2h. Downward-Extending Portion
2i. Soldered Portion
4. Toroidal Core

5. Coil Wire
6. Case
7. Substrate
8. Adhesive
9. Position Hole

[SCOPE OF UTILITY MODEL REGISTRATION CLAIMS]

[CLAIM 1] A small coil wire component wherein a core, whereon is wound a coil wire, is contained in a plastic case that is open on one face, where a coil wire wrapping portion of a terminal protrudes from the opening portion side of the case, and a base portion of a terminal, which is soldered to a substrate, protrudes from a face other than the open face of the case.

[BRIEF DESCRIPTION OF THE DRAWINGS]

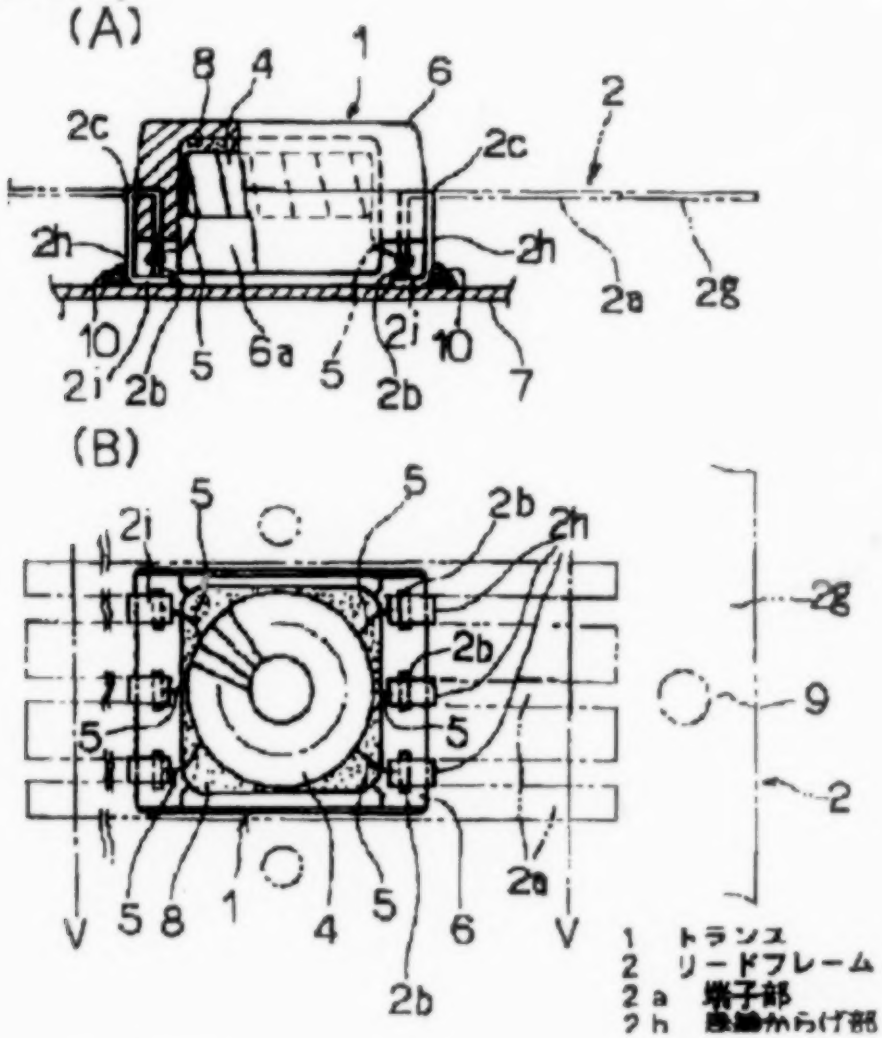
FIG. 1 (A) is a side view diagram that is a partial cutaway showing an example of embodiment (a surface mount type) of a small transformer according to the present invention, and FIG. 1 (B) is a plan view diagram thereof.

FIG. 2 (A) is a side view diagram illustrating an example of embodiment of a pin-type small transformer according to the present invention, and (B) is a plan view diagram thereof.

FIG. 3 (A) is a plan view diagram of a lead frame during a manufacturing process of a small transformer according to the present invention, and FIG. 3 (B) is a partially enlarged diagram of FIG. 3 (A).

FIG. 4 (A) is a plan view diagram of a lead frame during a manufacturing process for a small transformer according to the present invention, and FIG. 4 (B) is a cross-sectional diagram along the section E-E of FIG. 4 (A).

[FIG. 1]



1. Transformer
2. Lead Frame
2a. Terminal Portion
2b. Coil Wire Wrapping Portion

2c. Base Portion
2h. Downward-Extending Portion
2i. Soldered Portion
4. Toroidal Core
5. Coil Wire
6. Case
7. Substrate
8. Adhesive
9. Position Hole

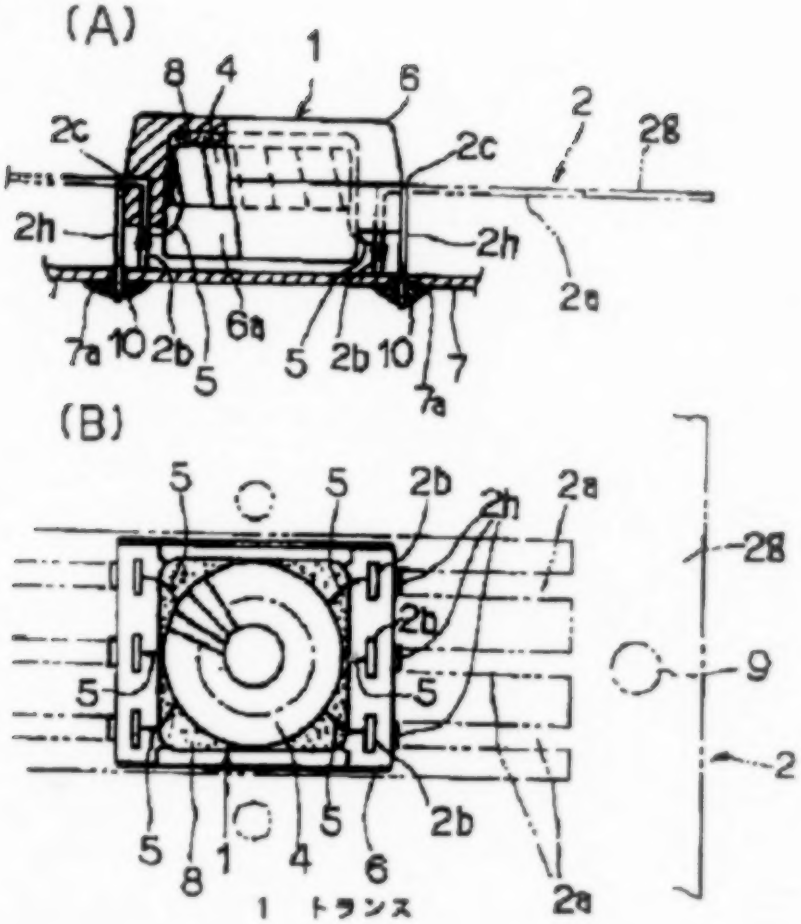
FIG. 5 (A) is a plan view diagram at the time that the case is molded in a small transformer according to the present invention, FIG. 5 (B) is a side view diagram thereof, and FIG. 5 (C) is a view in the direction of the arrow Y in FIG. 5 (A).

FIG. 6 is a perspective view illustrating the state during the manufacturing process in one example of a conventional small pulse transformer.

[EXPLANATION OF CODES]

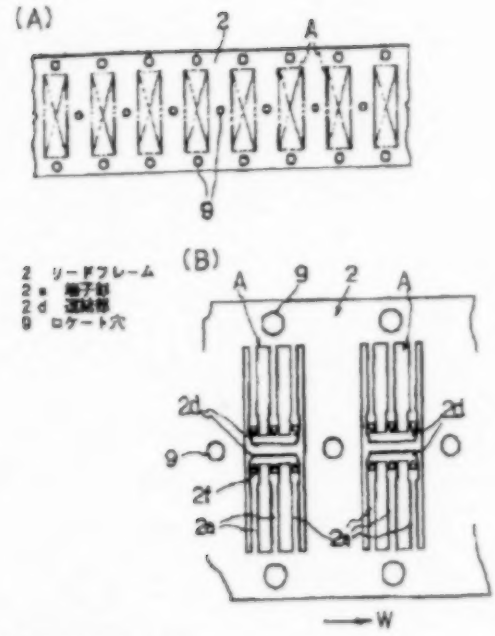
1. Transformer
2. Lead Frame
2a. Terminal Portion
2b. Coil Wire Wrapping Portion
2c. Base Portion
2h. Downward-Extending Portion
2i. Soldered Portion
4. Toroidal Core
5. Coil Wire
6. Case
7. Substrate
7a. Hole
8. Adhesive
9. Position Hole

[FIG. 2]



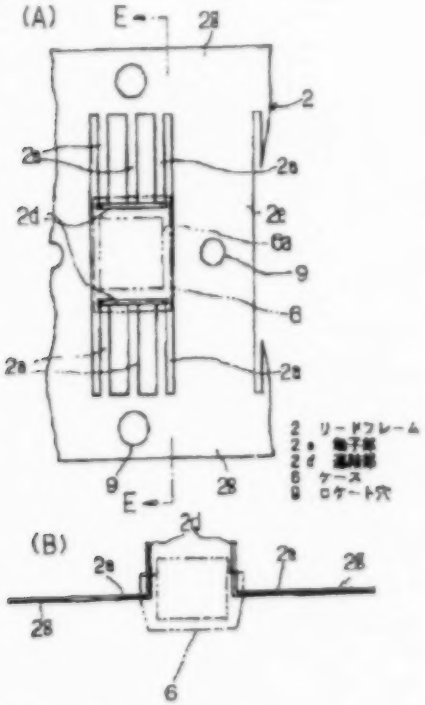
1. Transformer
2. Lead Frame
2a. Terminal Portion
2b. Coil Wire Wrapping Portion
2c. Base Portion
2h. Downward-Extending Portion
4. Toroidal Core
5. Coil Wire
6. Case
7. Substrate
7a. Hole
8. Adhesive
9. Position Hole

[FIG. 3]



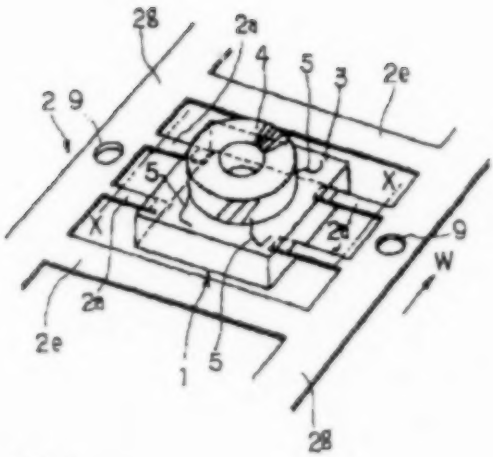
2. Lead Frame
2a. Terminal Portion
2b. Connecting Portion
9. Positioning Hole

[FIG. 4]

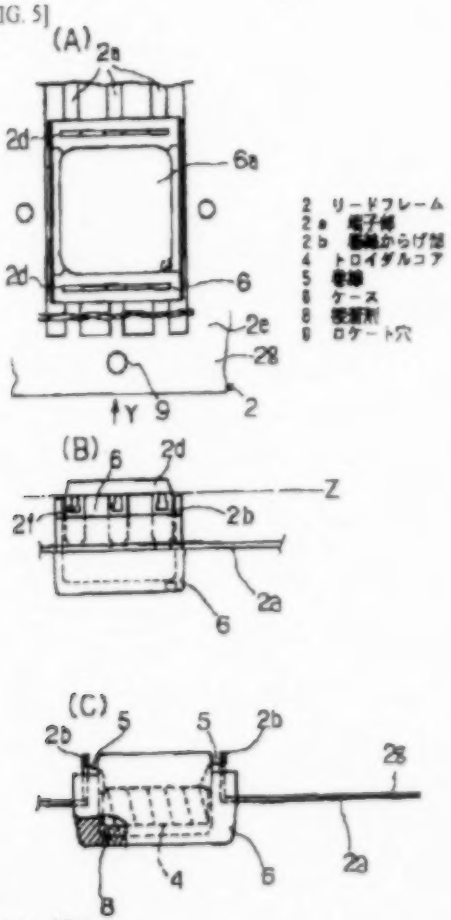


2. Lead Frame
2a. Terminal Portion
2b. Connecting Portion
6: Case
9. Positioning Hole

[FIG. 6]



[FIG. 5]



2. Lead Frame
2a. Terminal Portion
2b. Connecting Portion
4. Toroidal Coil
5. Color
6. Case
8. Adhesive Agent
9. Positioning Hole

[DETAILED EXPLANATION OF THE INVENTION]
[0001]
[AREA OF USE IN INDUSTRY]

The present invention relates to a small coil wire component such as a transformer or an inductor that is used in an electronic device, and, in particular, relates to a structure for a terminal portion for connecting a coil wire.

[0002]
[PRIOR ART AND PROBLEM SOLVED BY THE PRESENT INVENTION]

FIG. 6 is a perspective view illustrating a conventional small pulse transformer 1 in the process during manufacturing. In FIG. 6, 2 is a metal lead frame that is formed in a continuous punching process and fed in the direction of the arrow W, where the two side portions 2g and 2g are connected at equal intervals by bridging portions 2a, where a plurality of plate-shaped terminal portions 2a are formed between the bridging portions 2e, where plastic bases 3 are formed monolithically through insertion molding on the terminal portions 2a of the lead frame 2.

[0003]

However, in this type of structure, the coil wire wrapping portion of the terminal portion 2a is enclosed by the two side portions 2g of the lead frame 2, and thus operations by which to wrap the coil wire 5 onto the coil wire wrapping portion are not possible when the base 3 has been assembled onto the lead

frame 2. Because of this, the terminal portion 2a is cut at the portion indicated by the double dotted line X, and after the base 3 is cut from the two side portions 2g of the lead frame, then the toroidal core 4, which has been wound with the coil wire 5, is placed on the base 3, and the coil wire 5 is wrapped onto the coil wire wrapping portion of the terminal portion 2a and soldered. Because of this, the processing thereafter cannot be handled as a product chain wherein a plurality of individual transformers are integrated into a single unit by the lead frame, and thus there is a problem in that manufacturability is poor so the manufacturing cannot be performed efficiently.

[0004]

In consideration of the problem areas set forth above, the object of the present invention is to provide a small coil wire component of a structure wherein the operations for wrapping the coil wire onto the terminal can be performed in a continuous manufacturing process while the base, and the like, are integrated monolithically with the lead frame.

[0005]
[MEANS FOR SOLVING THE PROBLEM]

In order to achieve the object set forth above, the present invention is a small coil wire component wherein a core, whereon is wound a coil wire, is contained in a plastic case that is open on one face, where a coil wire wrapping portion of a terminal protrudes from the opening portion side of the case, and a base portion of a terminal, which is soldered to

a substrate, protrudes from a face other than the open face of the case.

[0006]

[OPERATION] Because the present invention has the structure set forth above, the operation for wrapping the coil wire onto the terminal is performed continuously while the operator observes the wrapping portion of the coil wire onto the terminal in a state wherein the plastic case is attached to the lead frame and wherein the open face of the case is upward.

[0007]
[EXAMPLES OF EMBODIMENT]

FIG. 1 (A) is a partial cutaway side view diagram of one example of embodiment of a small transformer (of a surface mount type) as set forth in the present invention, and FIG. 1 (B) is a plan view diagram thereof. As illustrated in FIG. 1 (A) and (B), the small transformer according to the present invention is structured with a toroidal core 4, on which is wound the coil wire, contained in a plastic case 6 that has an opening portion 6a in the face that faces the substrate 7, adhered by an adhesive 8, where the coil wire 5 of the toroidal core 4 is wrapped onto a coil wire wrapping portion 2b and soldered (10). Additionally, a middle portion of the terminal 2a is embedded in the plastic case 6, where a coil wire wrapping portion 2b of one end of the terminal 2a protrudes vertically towards the substrate 7 from the opening portion 6a side of the plastic case 6, and the base portion 2c that is the other end protrudes from a side face of the case

6, where the part from the base portion 2c to the tip end thereof is structured from a downward-extending portion 2h that is positioned towards the outside of the coil wire wrapping portion 2b, and a soldering portion 2a that is formed by bending towards the inside from the downward-extending portion 2h.

[0008]

FIG. 2 (A) is a partial cutaway side view diagram of an example of embodiment of a small transformer of a pin type according to the present invention, and FIG. 2 (B) is a plan view diagram thereof. In FIG. 2 (A) and (B), the pin type differs from the example of embodiment described above (the surface mount type) only in the structure of the portion wherein the base portion 2c is soldered to the substrate 7, where, as illustrated, after the downward-extending portion 2h has passed through a hole 7a that is provided in the substrate 7, it is soldered (10) to the substrate 7 on the side that is opposite from the coil wire wrapping portion 2b.

[0009]

In the manufacturing in the examples of embodiment set forth above, first, as illustrated in FIG. 3 (A) and in FIG. 3 (B), which is an expanded view thereof, the metal lead frame 2 is punched out. The terminal portion 2a is formed connected in the press feeding direction W in the press punching process. Here, in FIG. 3 (A) and (B), the A portion is the punched-out of portion, 2a is the terminal portion, and 2d is a connecting portion for lining up a plurality of terminal

portions 2a in the direction of the tip ends thereof, with this connecting portion 2d is not absolutely necessary. 2f is a coil wire wrapping hole, and 9 is a positioning hole for the press feeding.

[0010]

As illustrated in FIG. 4 (A), next the end portion of the terminal portion 2a is bent in a direction that is perpendicular to the plane of the paper in a press bending process, to form an L shape, as illustrated in FIG. 4 (B), which is a cross-sectional diagram along the section E-E in FIG. 4 (A). Then, as illustrated by the double dotted lines in FIG. 4 (A) and (B), a plastic case 6 is formed integrally with the terminal portion 2a. FIG. 5 (A) is a plan view diagram illustrating the state wherein the plastic case 6 has been formed integrally through insertion molding with the terminal portion 2a of the lead frame 2, and FIG. 5 (B) is a view in the direction of the arrow A in FIG. 5 (A), and FIG. 5 (C) is a partial cutaway side view diagram of FIG. 5 (A). As illustrated in FIG. 5 (B), one end portion of the terminal portion 2a protrudes from the opening portion 6a side of the case 6, and a coil wire wrapping portion 2b is formed with the coil wire wrapping hole 2f facing upward by cutting the connecting portion 2b at the tip end at the position of the single dotted line Z.

[0011]

Forming the coil wire wrapping portion 2b in this way, extending from the opening portion 6a side of the case 6 makes it possible to house the toroidal core

4 in the case 6 in the subsequent process, as illustrated in FIG. 5 (C), and then, after securing using an adhesive 8, or the like, to wrap the coil wire 5 of the toroidal core 4 onto the coil wire wrapping portion 2b, and then to solder by dipping in a solder tank, in a continuous manufacturing process with the case 6 integrated with the lead frame 2. This makes it possible to automate the soldering with the case 6 connected to the lead frame 2.

[0012]

Note that adhesive tape or a plastic molding structure may be used as the means for securing the core 4 to the case 6. Additionally, instead of the toroidal core, a drum core, or some other core may be used as the core for that is contained in the case 6.

[0013]

[EFFECTS OF THE INVENTION] Given the present invention, the coil wire wrapping portion of one end of the terminal protrudes from the opening portion side of the core-containing case and the coil wire that is wound on the core and the coil wire wrapping portion extend in the same direction relative to the lead frame, thus making it possible to wrap the coil wire onto the coil wire wrapping portion, while an operator observes the connecting portion, and to perform soldering by dipping in a solder tank, continuously from the process for processing the lead frame, doing so with the case connected to the lead frame, thus making it possible to perform the operation for connecting the coil wire continuously and with excellent

efficiency. The soldering can also be automated, thus enabling the coil wire connecting operations to be performed with even higher efficiency.

UNITED STATES DISTRICT COURT DISTRICT OF NEVADA

(Admitted Into Evidence On 11/14/12)

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NOTES:

1. INTERPRET THIS SPECIFICATION PER MIL-T-31000 AND STANDARDS REFERENCED THEREIN.
2. ALL TEST CONDITIONS PER MIL-STD-202. PARA. 2.2, EXCEPT TEMPERATURE TO BE 25 ±5°C.

PARTS LIST

ITEM	QTY	UM	PART NUMBER	DESCRIPTION	CAGE CODE	MATERIAL SPECIFICATIONS
1	2	EA	WC1-64993	WOUND COIL ASSEMBLY		
2	2	EA	024-0170.001	LEAD FRAME		
3	1	EA	043-1241.001	CASE – 16 PIN		
4	.0005	GA	081-0185.001	EPOXY XT5038-6		AMICON
5	.00005	GA	081-0185.002	HARDENER B-100		AMICON
6	A/R	LB	081-0176.001	COATING 1-2577		
7	A/R	OZ	081-0174.002	CATALYST #176		
8	A/R	LB	083-0054.001	SOLDER Sn10 BAR		
9	A/R	EA	082-0002.001	INK: MARKEM 7254		
10	A/R	GA	083-0017	SOLDER FLUX 1015 KESTER		
11	.05	EA	075-0239.001	SHIPPING TUBE		

ENG.RELEASED

REV	DESCRIPTION	ECN	DATE	APPROVED
A	NEW RELEASE		12/18/91	/s/ ll

REVISIONS

APPLICABLE TEST FIXTURES AND/ OR PROCEDURES:

1. JM-18436 ASSEMBLY FIXTURE
2. P-20913 SILICONE COATING PROCEDURE
3. P-21274 ASSEMBLY PROCEDURE
4. P-21275 ENCAPSULATION PROCEDURE

UNLESS OTHERWISE SPECIFIED, FIELD DIMENSIONS IN INCHES BEFORE PLATING. TOLERANCES ARE:
XX ± .01

APPROVALS	DATE
DRAWN /s/ C. MULLIGAN	12/11/91
CHECKED /s/ [Illegible]	12/14/91
DSGN ENGR /s/ [Illegible]	12/19/91

[LOGO] Pulse®

San Diego, California

TITLE

TRANSFORMER ISDN, SMT

5. JM-18456 GULL WING FORMING DIE 6. JM-18457 FINAL TRIM DIE 7. JE-18465 TEST FIXTURE	XXX ±.005 DO NOT SCALE DRAWING	[ILLEGIBLE] /s/ [Illegible]	12/19/91				
	material	[ILLEGIBLE] /s/ [Illegible]	12/19/91	SIZE B	CODE IDENT. 01961	DWG NO. PE-65793	REV A
		[ILLEGIBLE] /s/ [Illegible]					
	finish	OTHER /s/ [Illegible]	12/19/91	SCALE NONE	CARD FILE 65793-1		SHEET 1 OF 3

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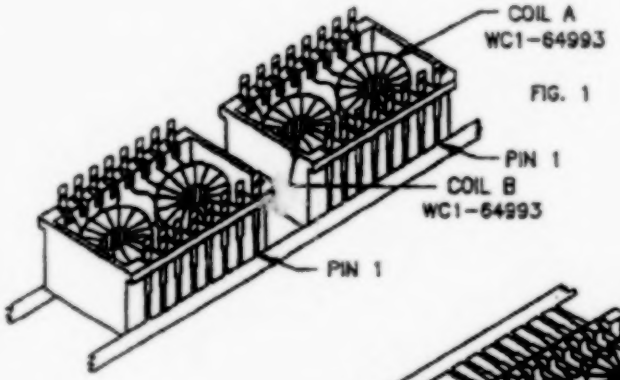


FIG. 1

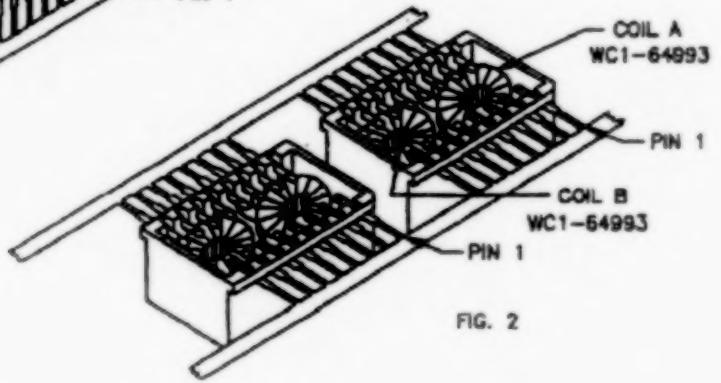
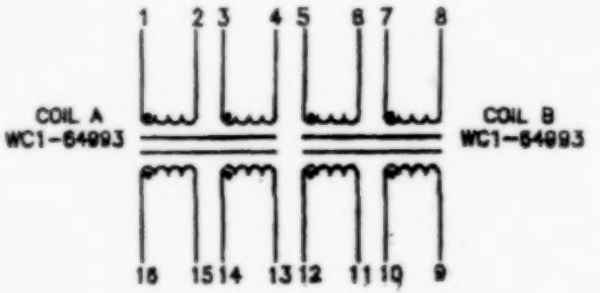


FIG. 2

ASSEMBLY NOTES:

1.0 DIP TWO TIMES IN SILICON 1-2577 PER P-20913 PROCEDURE (2 COILS)
2.0 PLACE THE COILS INTO CASE AND TERMINATE WIRES TO ASSIGNED LEADS (SEE FIG. 1).
3.0 FLUX DIP LEAD TIPS, SOLDER DIP LEAD TIPS AND CLEAN ASSEMBLY OF FLUX RESIDUE
4.0 ROTATE LEAD FRAMES TO THE HORIZONTAL POSITION & ENCAPSULATE PER PROCEDURE P-21275 (SEE FIG. 2).
5.0 REMOVE COMPONENTS FROM FIXTURES
6.0 STAMP TOP SURFACE OF COMPONENTS
7.0 TRIM TIE BARS
8.0 FINAL TEST
9.0 FORM GULLWING
10.0 LOAD INTO SHIPPING TUBES



SCHEMATIC

B	01961	PE-65793	A
SCALE NONE		SHEET 2 OF 3	

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TEST NOTES

1.0 TURNS RATIO 1.0VRMS 10KHZ (100%)

$$\frac{(1-4)}{(16-13)} = \frac{(5-8)}{(12-9)} = 1.0 +/-2\%$$

$$\frac{(1-2)}{(3-4)} = \frac{(16-15)}{(14-13)} = \frac{(5-6)}{(7-8)} = \frac{(12-11)}{(10-9)} = 1.0 +/-2\%$$

2.0 INDUCTANCE 1.0KHZ .02VRMS (100%)

(1-4) WITH (2-3) SHORT
(5-8) WITH (6-7) SHORT
=> 22mH MIN 0.0Adc 100%
20mH MIN 1mAdc (SAMPLE)

3.0 LEAKAGE INDUCTANCE 100KHZ .02V (SAMPLE)

(16-13) WITH (15-14),(1-4),(2-3)SHORT = 5uH MAX

(12-9) WITH (11-10),(5-8),(6-7)SHORT = 5uH MAX

4.0 CWW 100KHZ .02VRMS (SAMPLE)

(1,2,3,4)SHORT TO (16,15,14,13) = 100pF MAX

(5,6,7,8)SHORT TO (12,11,10,9) = 100pF MAX

5.0 DISTRIBUTED CAPACITANCE 1MHz (SAMPLE)

(1-4) WITH(2-3),(15-14)SHORT = 40pF MAX

(5-8) WITH (6-7),(11-10)SHORT = 40pF MAX

6.0 DCR VALHALLA 4100ATC (SAMPLE)

(1-4) = (5-8) = 2.4 +/- 15% Ohms

(16-13) = (12-9) = 2.4 +/- 15% Ohms

(1-2) = (3-4) +/- 2%

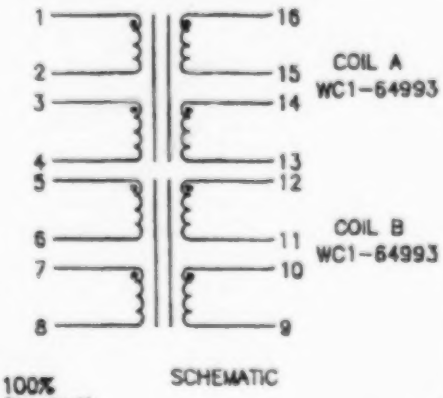
(5-6) = (7-8) +/- 2%

7.0 LONGITUDINAL BALANCE FIG. 1 (SAMPLE)

(1-4) INPUT, (16-13) OUTPUT 50KHZ - 300KHZ 60dB MIN

(5-8) INPUT, (12-9) OUTPUT 1MHz 48dB MIN

8.0 HIPOT (1-4) TO (16-13) 2000VRMS 1 MINUTE (100%)
(5-8) TO (12-9) 2200VRMS 6SEC



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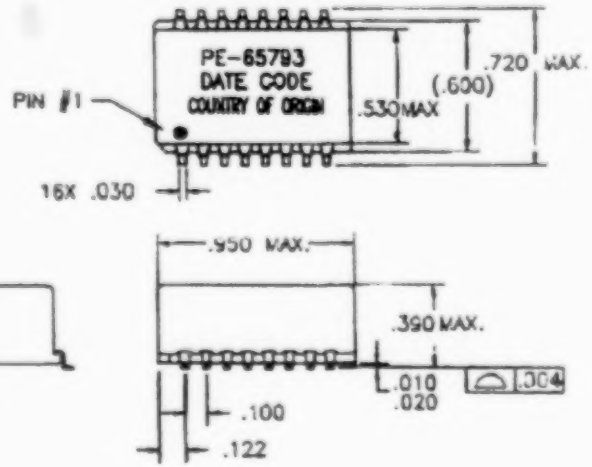

FINAL OUTLINE

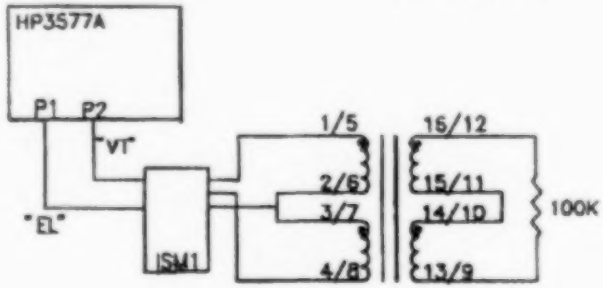

FIG. 1 LONGITUDINAL BALANCE

FINAL NOTES:

1.0 TEST 100% PER TEST NOTES 1.0,2.0 & 8.0.
2.0 SAMPLE TEST PER REMAINING NOTES.
3.0 TRIM LEADS PER FINAL OUTLINE

B	01961	PE-65793	A
SCALE NONE	CAD FILE 65793-3	SHEET 3 OF 3	

Pulse Engineering Inc.
San Diego, California 92112

CUSTOMER CATALOG PE – 65793
JOB NUMBER _____ REV _____

LIST OF MATERIALS

ITEM NO.	QTY REQD	PART NUMBER	DESCRIPTION	SPECIFICATIONS OR NOTES
1	2	WC1-64993	WOUND COIL ASSEMBLY	
2	± 2	024-0170.001	LEAD FRAME	
3	1	043-1241.001	CASE - 16 PIN	
4	GL .0005	081-0185.001	EPOXY XT5038-6	AMICON
5	GL .00005	081-0185.002	HARDENER B-100	AMICON
6	A/R	081-0176.001	COATING 1-2577	
7	A/R	081-0174.002	CATALYST #176	
8	A/R	083-0054.001	SOLDER Sn10 BAR	
9	A/R	082-0007.001	INK: MARKEM 9060	

TEXT FIXTURE AND/OR PROCEDURE

NOTES:

1.0 IN THE EVENT OF CONFLICT BETWEEN THIS SPECIFICATION AND THE CUSTOMER SPECIFICATIONS, THE LATTER SHALL GOVERN.

2.0 INTERPRET THIS SPECIFICATIONS PER MIL-D-1000 AND STANDARDS REFERENCED THEREIN

3.0 ALL TEST CONDITIONS PER MIL-STD-202, PARA2.2, EXCEPT TEMPERATURE TO BE 25 ±5°C.

PRIORIDAD
Orden Prototipo
TENTATIVE

PJ12513CPK Qty 25 /s/ [Illegible] 9/17/91

LTR	DESCRIPTION	ECO NO.	DATE	APPROVED

REV STATUS REVISION
OF SHEETS SHEET 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS IN INCHES BEFORE PLATING.
TOLERANCES ON:
FRACTIONS = ± _____
ANGLES = ± _____
DECIMALS: 0.XX = ± _____
0.XXX = ± _____

REF: CUSTOMER CATALOG
DRAWING _____ REV _____
DATE _____ ☐ EXCEPTIONS; NOTE _____

		DATE
DRAWN		
CHECKED		
ENG.APPD.		
PROJ.APPD.		
APPROVED		

Pulse Engineering, Inc.
San Diego, California 92112

TITLE
TRANSFORMER
ISDN, SMT

SIZE	CODE IDENT.	DRAWING NO.	REV
		PE-65793	XO1

SCALE = | OK /s/ [Illegible] 9/17/91 | SHEET 1 of 3

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WINDING DATA

	COIL A		COIL B	
WINDING				
WIRE SIZE				
TRAVERSE				
TURNS/LAYER				
LAYER INSULATION	SEE WC1-64993		SEE WC1-64993	
NUMBER OF LAYERS	FOR LATEST DESIGN		FOR LATEST DESIGN	
TOTAL TURNS				
INSULATION				
LEAD IDENT.				

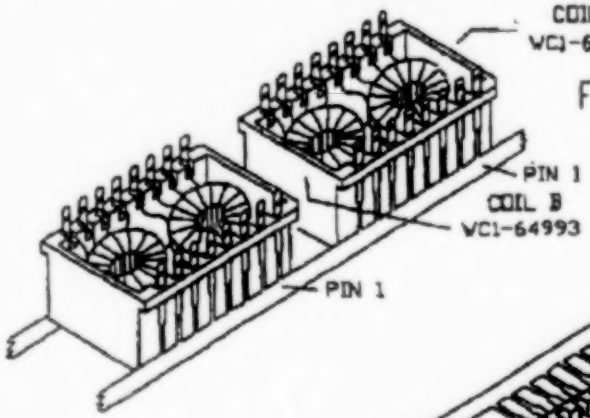


FIG. 1

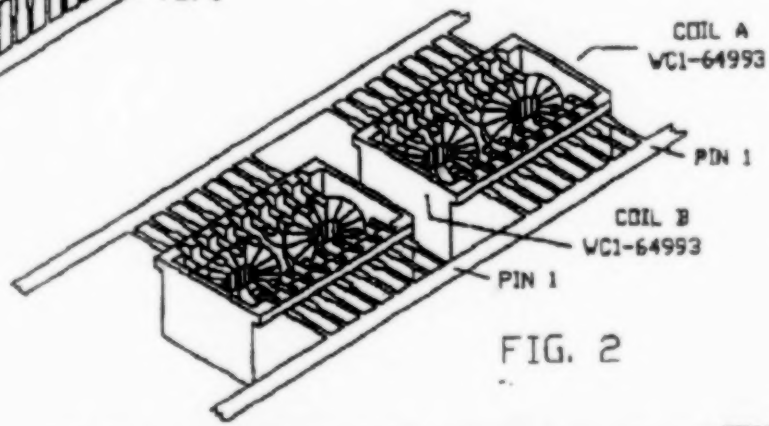
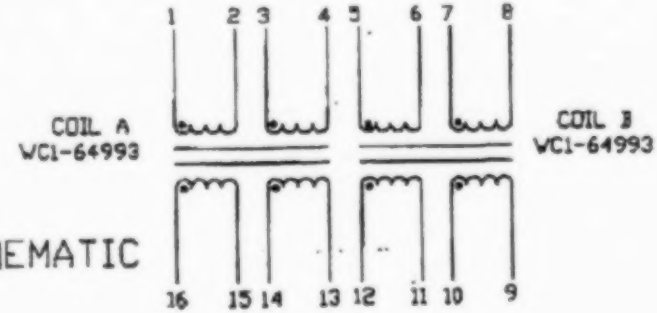


FIG. 2

ASSEMBLY NOTES:

1.0 DIP TWO TIMES IN SILICON 1-2577 PER P20913 PROCEDURE (2 COILS)
2.0 PLACE THE COILS INTO CASE AND TERMINATE WIRES TO ASSIGNED LEADS (SEE FIG. 1).
3.0 FLUX DIP LEAD TIPS, SOLDER DIP LEAD TIPS AND CLEAN ASSEMBLY OF FLUX RESIDUE
4.0 ROTATE LEAD FRAMES TO THE HORIZONTAL POSITION & ENCAPSULATE PER PROCEDURE P20964 (SEE FIG. 2).
5.0 REMOVE COMPONENTS FROM FIXTURES
6.0 STAMP TOP SURFACE OF COMPONENTS
7.0 TRIM TIE BARS
8.0 FINAL TEST
9.0 FORM GULLWING
10.0 LOAD INTO SHIPPING TUBES



SCHEMATIC

SIZE	CAGE IDENTIFICATION	DRAWING NUMBER	REV
B	01961	PE-65793	X01
SCALE		SHEET 2 OF 3	

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TEST NOTES

1.0 TURNS RATIO 1.0VRMS 10KHZ (100%)

$\frac{(1-4)}{(16-13)} = \frac{(5-8)}{(12-9)} = 1.0 +/-2\%$

$\frac{(1-2)}{(3-4)} = \frac{(16-15)}{(14-13)} = \frac{(5-6)}{(7-8)} = \frac{(12-11)}{(10-9)} = 1.0 +/-2\%$

2.0 INDUCTANCE 1.0KHZ .01VRMS (100%) 20mV

(1-4) WITH (2-3) SHORT => 22nH MIN 8.0Adc 100%

(5-8) WITH (6-7) SHORT 20nH MIN 1mAdc (SAMPLE)

3.0 LEAKAGE INDUCTANCE 100KHZ .02V (SAMPLE)

(16-13) WITH 15-14),(1-4),(2-3)SHORT = 5uH MAX

(12-9) WITH (11-10),(5-8),(6-7)SHORT = 5uH MAX

4.0 CVW 100KHz .02VRMS (SAMPLE)

(1,2,3,4)SHORT TO (16,15,14,13) = 100pF MAX

(5,6,7,8)SHORT TO (12,11,10,9) = 100pF MAX

5.0 DISTRIBUTED CAPACITANCE 1MHZ (SAMPLE)

(1-4) WITH(2-3),(15-14)SHORT = 40pF MAX

(5-8) WITH (6-7),(11-10)SHORT = 40pF MAX

6.0 DCR VALHALLA 4100ATC (SAMPLE)

(1-4) = (5-8) = 2.4 +/- 15% Ohms

(16-13) = (12-9) = 2.4 +/- 15% Ohms

7.0 LONGITUDINAL BALANCE FIG. 1 (SAMPLE)

(1-4) INPUT, (16-13) OUTPUT 50KHZ - 300KHZ 60dB MIN

(5-8) INPUT, (12-9) OUTPUT 1MHz 48dB MIN

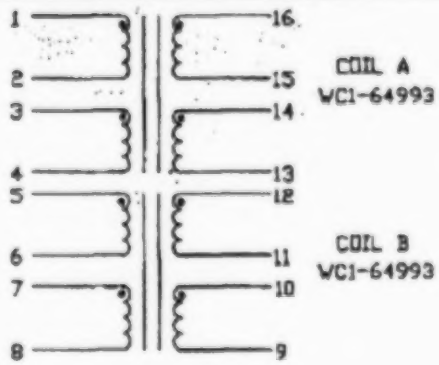
8.0 RISE TIME FIG. 2 RS = 100OHMS, RL=50 OR 400 OHMS. (SAMPLE)

INPUT (1-4) OR (5-8) 400nS INPUT RISETIME

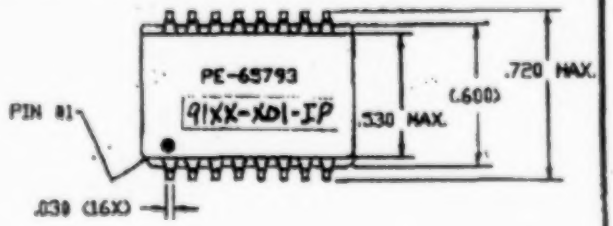
OUTPUT (16-13) OR (12-9) = 470nS MAX

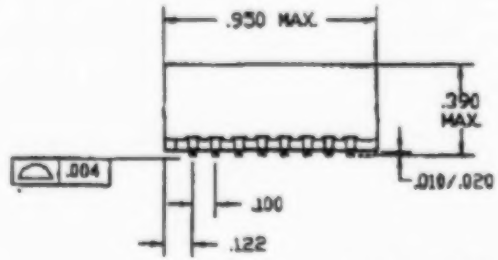
9.0 HIPOT (1-4) TO (16-13) 2000VRMS 1 MINUTE (100%)

(5-8) TO (12-9) 2200VRMS 6SEC



SCHEMATIC





FINAL OUTLINE

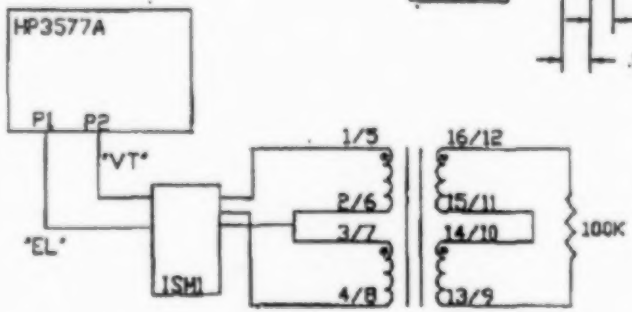


FIG. 1 LONGITUDINAL BALANCE

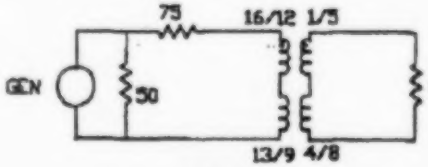


FIG. 2
RISETIME

FINAL NOTES:

1.0 TEST 100% PER TEST NOTES 1.0,2.0 & 9.0

2.0 SAMPLE TEST PER REMAINING NOTES.

3.0 TRIM LEADS PER FINAL OUTLINE

SIZE	CODE IDENTIFICATION	DRAWING NUMBER	REV
B	01961	PE-65793	X01
SCALE		SHEET 3 of 3	

NOTICE: THE INFORMATION AND DESIGN CONTAINED HEREIN IS THE PROPERTY OF PULSE ENGINEERING, INC. AND RESERVED ALL RIGHTS THERETO.

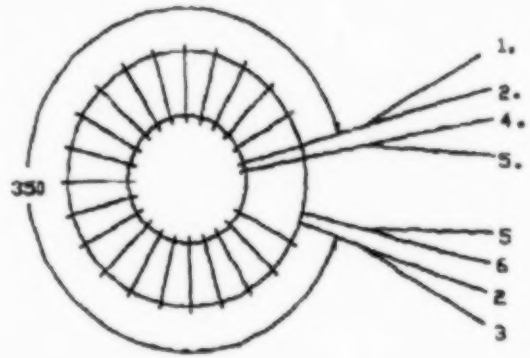
WINDING DATA

WINDING	SEC A	SEC B	PRI A	PRI B
WIRE SIZE	38QPN R	38QPN G	38QPN N	38QPN G
TRAVERSE	350	350	350	350
TURNS/LAYER				
LAYER INSULATION				
NUMBER OF LAYERS				
TOTAL TURNS	34	34	34	34
INSULATION				
LEAD IDENT.	4. 5	5. 6	1. 2	2. 3

IT.2 TWISTED — IT.3 TWISTED

BIFILAR

REVISIONS					
ZONE	LTR	DESCRIPTION	ECO NUMBER	DATE	APPROVED
	D	CHANGE PER ECN	22948	2/21/91	AD
	F	CHANGE PER ECN	22960	3/14/91	
	G	CHANGE PER E C N	PL23024	5/3/91	



NOTES:

1. WIND FULL COIL ON TWISTED WIRE KENT MACHINE.
2. SAMPLE TEST PER TEST NOTES:
   - 2.1 TURNS RATIO: 1V 10KHZ
     (1-3)/(4-6) = 1.0+/-2%
   - 2.2 INDUCTANCE 100KHZ ,02V
     (1-3) = 22mH MIN
   - 2.3 LEAKAGE 100KHZ .02V
     (4-6) TO (1-3) Y (5-5)
     (2-2) SHORT
     [illegible] MAX.

ENG. RELEASED

ITEM	QTY	PART NO.	DESCRIPTION	CODE IDENT	MFR'S PART NO.	SPECIFITION
6		094-SP380-0191	WIRE: 38Q E/N T80 BOND			
5		094-SP380-0179	WIRE: 38Q E/G T80 BOND			
4		021-0478AAE	CORE YW-41005-TC		MAG INC	[illegible]
3		094-SP380-0192	WIRE 38Q R/N T120 BOND			ALT-6
2		094-SP380-0194	WIRE 38Q R/G T120 BOND			ALT-5
1		021-0438AAE	CORE LTA-AQ5C-5D/1P		KRYST.	ALT-4

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

DRAWN M McV

CHECKED Rodriguez

ENGG APPR

PROJ APPR

APPROVED

MATERIAL:

FINISH:

Pulse Engineering, Inc.
San Diego California 92112

TITLE
WOUND COIL, ISDN

SIZE	CODE IDENTIFICATION	DRAWING NUMBER	REV
B	01961	WC1-64993	G

SCALE NONE — SHEET 1 OF 1

[LOGO] **PULSA PROTOTYPES.**

TEST DATA SHEET.

PE-65793		**CUSTOMER:**	CATALOG	**DATE:**	2-Nov-91
CORE:		**TURNS:**	Twist. 34v bifilar	**WIRE:**	38 Q
WDG. GEOM.		**GAP:**		**IN PROCESS:**	
HEAD/CASE:		**COATING:**		**FINAL:**	
WDG. TYPE:	bobinado Automatico	**TECHNICIAN:**	Adriana V.		

SPECIFICATION:

	(1-4) with S/B (2-3) SHT OCL	(5/8) with C/B (6-7) SHT OCL	(16-13) with (15-14) (1-4) (2-3) SHT LL	(12-9) with (11-10) (5-8) SHT (6-7) LL	(1,2,3,4) TO (16,15,14,13) CWW	(5,6,7,8) TO (12,11,10,9) CWW
1	27.13	27.30	2.95	2.83	44.41	44.19
2	28.10	24.29	2.26	2.56	44.28	42.37
3	28.35	27.09	2.67	2.23	35.88	42.65
4	28.16	25.01	2.29	2.21	43.26	42.18
5	27.26	25.89	2.02	2.57	45.30	44.26
6	26.01	27.05	2.51	3.27	44.00	40.80
7						
8	25.82	24.52	2.41	2.19	43.40	44.07
9	26.53	26.95	2.28	2.52	41.86	40.15
10						
	22 mH MIN 0 ADC 1 KHZ 20 MV 4284 A	20 mH MIN 1mADC 1 KHZ 20 MV 4284 A	5 mH MAX 100 KHZ 20 MV 4284 A	5 mH MAX 100 KHZ 20 MV 4284 A	100 pf MAX 100 KHZ 20 MV 4284 A	100 pf MAX 100 KHZ 20 MV 4284 A

/s/ [Illegible]

[LOGO] **PULSA PROTOTYPES.**

TEST DATA SHEET.

PE-65793		**CUSTOMER:**	CATALOG	**DATE:**	2-Nov-91
CORE:		**TURNS:**	Twist. 34v bifilar	**WIRE:**	38 Q
WDG. GEOM.		**GAP:**	N/A	**IN PROCESS:**	
HEAD/CASE:		**COATING:**		**FINAL:**	
WDG. TYPE:	bobinado Automatico	**TECHNICIAN:**	Adriana V.		

SPECIFICATION:

	(1-4) with (2-3) (15-14) SHT COL	(5-8) with (6-7) (11-10) SHT COL	(1-4) DCR	(5-8) DCR	(16-13) DCR	(12-9) DCR
1	30.64	30.48	2.50	2.43	2.34	2.37
2	30.33	30.24	2.43	2.44	2.38	2.37
3	28.82	30.31	2.45	2.40	2.34	2.37
4	30.52	30.35	2.50	2.48	2.39	2.39
5	29.82	30.43	2.48	2.53	2.41	2.40
6	29.42	30.16	2.49	2.42	2.38	2.38
7						
8	29.40	28.75	2.44	2.40	2.35	2.35
9	29.01	30.23	2.42	2.42	2.39	2.32
10						
	40 pf MAX 1 MHz 4284 A	40 pf MAX 1 MHz 4284 A	2.04 Ω MAX 2.76 Ω MAX 4100 ATC	2.04 Ω MAX 2.76 Ω MAX 4100 ATC	2.04 Ω MAX 2.76 Ω MAX 4100 ATC	2.04 Ω MAX 2.76 Ω MAX 4100 ATC

/s/ [Illegible]
11/5/91

[LOGO] **PULSA PROTOTYPES.**

TEST DATA SHEET.

PE-65793		**CUSTOMER:**	CATALOG	**DATE:**	5-Nov-91
CORE:		**TURNS:**	Twist. 34v bifilar	**WIRE:**	38 Q
WDG. GEOM.		**GAP:**	N/A	**IN PROCESS:**	
HEAD/CASE:		**COATING:**		**FINAL:**	
WDG. TYPE:	bobinado Automatico	**TECHNICIAN:**	Adriana V.		

SPECIFICATION:

	TR	Pol.	Hipot	Rise T.	Rise T.	
1	0 K	0 K	0 K	392	384	
2	0 K	0 K	0 K	381	388	
3	0 K	0 K	0 K	385	382	
4	0 K	0 K	0 K	387	390	
5	0 K	0 K	0 K	384	391	
6	0 K	0 K	0 K	388	388	
7						
8	0 K	0 K	0 K	389	385	
9	0 K	0 K	0 K	391	393	
10						
				470 ns MAX	470 ns MAX	/s/ [Illegible] 11/5/91

[LOGO] **PULSA PROTOTYPES.**

TEST DATA SHEET.

PE-65793		**CUSTOMER:**	CATALOG	**DATE:**	5-Nov-91
CORE:		**TURNS:**	Twist. 34v bifilar	**WIRE:**	38 Q
WDG. GEOM.		**GAP:**	N/A	**IN PROCESS:**	
HEAD/CASE:		**COATING:**		**FINAL:**	
WDG. TYPE:	bobinado Aut	**TECHNICIAN:**	Adriana V.		

SPECIFICATION:

	50 KHZ	300 KHz	1 MHz	50 KHz	300 KHz	1 MHz
1	-69.81	-63.83	-54.34	-70.20	-63.95	-54.21
2	-70.39	-63.99	-54.02	-69.99	-63.73	-54.34
3	-70.55	-63.07	-54.25	-70.23	-63.98	-54.27
4	-70.62	-63.65	-54.23	-69.75	-63.43	-54.19
5	-70.95	-63.36	-54.36	-69.36	-63.52	-54.20
6	-70.09	-63.47	-54.10	-70.23	-67.77	-54.18
7						
8	-69.43	-63.81	-54.22	-69.85	-63.89	-54.31
9	-70.03	-63.77	-54.27	-70.34	-63.57	-54.18
10						
	60 dB MIN	60 dB MIN	48 dB MIN	60 dB MIN	60 dB MIN	48 dB MIN /s/ [Illegible] 11/5/91

[LOGO] **INDUSTRIAS PULSA DE C.V.**

TEST DATA SHEET

CUST. P.N. J AIDACO *REV.* B PE- 65793 *REV.* B DATE CODE 923B

INSPECTOR Rosalba *DATE* 17-Agosto-92

NO	TURNS RATIO POL	CWW	CWW	OCL	OCL	OCL	OCL	LL	LL	CD	CD	DCR	DCR	DCR	DCR	HIPOT	
1	OK	66.91	71.90	27.02	25.56	24.07	22.55	1.86	1.96	29.22	30.19	2.51	2.53	2.41	2.39	OK	
2	OK	70.33	65.29	25.35	23.68	25.20	22.88	2.21	2.19	28.84	28.60	2.55	2.51	2.40	2.41	OK	
3	OK	68.72	68.06	27.31	25.68	27.03	24.40	2.86	2.06	28.77	27.95	2.52	2.54	2.44	2.41	OK	
4	OK	69.63	73.48	24.69	23.31	29.54	25.66	2.31	1.73	28.93	28.66	2.54	2.54	2.41	2.40	OK	
5	OK	67.99	68.05	25.14	23.66	24.94	23.20	3.76	2.18	30.10	29.24	2.52	2.55	2.42	2.41	OK	
6	OK	70.46	68.70	24.88	23.74	23.67	21.93	1.54	2.16	29.71	28.94	2.55	2.59	2.40	2.42	OK	
7	TR*	68.46	70.42	25.50	23.47	24.52	22.63	1.89	1.99	25.84	30.27	2.39	2.31	2.52	2.52	OK	
8	OK	70.63	68.25	23.29	22.02	25.44	23.74	2.30	2.91	27.63	30.76	2.57	2.54	2.41	2.42	OK	
9	OK	68.47	62.51	26.28	24.54	28.14	24.44	2.31	3.04	29.47	28.27	2.53	2.53	2.40	2.41	OK	
0	OK	68.92	67.97	27.35	25.07	23.67	22.79	2.95	2.20	28.50	29.74	2.55	2.57	2.43	2.43	OK	
1		100 KHz .02 VRMS 100PF MAXIMUM	100 KHz .02 VRMS 100PF MAXIMUM	1.0 KHz .02 VRMS 22MH MIN	1.0 KHz .02 VRMS 20 MH MIN IMADC	1.0 KHz .02 VRMS 22MH MIN	1.0 KHz .02 VRMS 20MH MIN IMADC	100 KHz .02 V 50UH MAXIMUM	100 KHz .02 V 50UH MAXIMUM	1 MHz SAMPLE 42 PF MAXIMUM	1 MHz SAMPLE 42PF MAXIMUM	2.04 MIN-2.76 MAX OHMS	2.04 MIN-2.76 MAX OHMS	2.04 MIN-2.76 MAX OHMS	2.04 MIN-2.76 MAX OHMS	2200 VRMS 6/SEC.	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
0																	

COMMENTS * PIEZA MALA OK

/s/ [Illegible] 8/17/92

[LOGO] **INDUSTRIAS PULSA DE C.V.**

TEST DATA SHEET

CUST. P.N. J AIDACO *REV.* B PE- 65793 *REV.* B DATE CODE 9233

INSPECTOR Rosalba *DATE* 17-Agosto-92

NO	50 KHz	300 KHz	1 MHz			50 KHz	300 KHz	1 MHz									
1	70.25	63.81	54.26			70.22	63.64	54.22									
2	70.45	63.67	54.24			70.11	68.74	54.30									
3	70.10	63.89	54.28			70.18	63.96	54.33									
4	70.23	63.67	54.29			69.97	63.79	54.35									
5	70.15	63.68	54.29			69.89	63.61	54.33									
6	70.26	63.73	54.26			69.92	63.66	54.31									
7	70.21	63.76	54.30			69.99	63.89	54.34									
8	70.19	63.83	54.28			70.26	63.87	54.40									
9	70.10	63.93	54.26			70.43	63.89	54.32									
0	70.33	63.84	54.31			70.25	63.83	54.27									
1	60 dB MIN	60 dB MIN	48 dB MIN			60 dB MIN	60 dB MIN	48 dB MIN									
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
0																	

COMMENTS OK

/s/ [Illegible] 8/17/92